

Service Manual



# Service Manual

## KP202



Model : KP202



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# Table Of Contents

<b>1. INTRODUCTION .....</b>	<b>5</b>	<b>5. DOWNLOAD.....</b>	<b>81</b>
1.1 Purpose .....	5	5.1 Download .....	81
1.2 Regulatory Information.....	5	<b>6. BLOCK DIAGRAM.....</b>	<b>87</b>
1.3 Abbreviations .....	7	<b>7. Circuit Diagram .....</b>	<b>89</b>
<b>2. PERFORMANCE.....</b>	<b>9</b>	<b>8. PCB LAYOUT .....</b>	<b>97</b>
2.1 H/W Features.....	9	<b>9. ENGINEERING MODE .....</b>	<b>103</b>
2.2 Technical Specification .....	10	9.1 BB Test [MENU 1].....	104
<b>3. TECHNICAL BRIEF .....</b>	<b>15</b>	9.2 RF Test [MENU 2].....	106
3.1 Power Amplifier (SKY77318, U500).....	15	9.3 MF mode [MENU 3] .....	106
3.2 Transceiver (AD6548, U501) .....	17	9.4 Trace option [MENU 4] .....	107
3.3 FEM for Triband .....	19	9.5 Call timer [MENU 5] .....	107
3.4 26 MHz Clock (Crystal, X500).....	20	9.6 Fact. Reset [MENU 6].....	107
3.5 Baseband Processor (AD6720 , U104).....	21	9.7 S/W version.....	107
3.6 Display and Interface .....	28	<b>10. STAND ALONE TEST .....</b>	<b>108</b>
3.7 Camera Interface(AIT701G , U402).....	30	10.1 Introduction .....	108
3.8 Keypad Switches and Scanning .....	32	10.2 Setting Method.....	108
3.9 Microphone .....	33	10.3 Means of Test .....	109
3.10 Main Speaker.....	34	<b>11. AUTO CALIBRATION.....</b>	<b>111</b>
3.11 Headset Interface.....	35	11.1 Overview .....	111
3.12 Key Back-light Illumination.....	36	11.2 Equipment List .....	111
3.13 LCD Back-light Illumination.....	37	11.3 Test Jig Operation.....	112
3.14 VIBRATOR.....	38	11.4 Procedure .....	113
<b>4. TROUBLE SHOOTING .....</b>	<b>39</b>	11.5 AGC .....	115
4.1 RF Component.....	39	11.6 APC.....	115
4.2 RX Trouble.....	40	11.7 ADC .....	115
4.3 TX Trouble .....	45	<b>12. EXPLODED VIEW &amp; REPLACEMENT PART LIST ....</b>	<b>117</b>
4.4 Power On Trouble.....	51	12.1 Exploded View .....	117
4.5 Charging Trouble .....	53	12.2 Replacement Parts .....	119
4.6 Vibrator Trouble .....	55	12.3 Accessory .....	135
4.7 LCD Trouble.....	57		
4.8 Camera Trouble .....	60		
4.9 Speaker Trouble .....	63		
4.10 SIM Card Interface Trouble.....	65		
4.11 Earphone Trouble .....	67		
4.12 KEY backlight Trouble .....	69		
4.13 Receiver Trouble.....	71		
4.14 Microphone Trouble .....	73		
4.15 RTC Trouble .....	75		
4.16 Indicator LED Trouble .....	77		
4.17 Folder on/off Trouble.....	79		



# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

## 1.2 Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

# 1. INTRODUCTION

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## E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

## H. Electrostatic Sensitive Devices

### ATTENTION

**Boards, which contain Electrostatic Sensitive Device (ESD), are indicated  by the sign. Following information is ESD handling:**

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

### 1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current - Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIO	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop

## 1. INTRODUCTION

---

PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

## 2. PERFORMANCE

### 2.1 H/W Features

Item	Feature	Comment
Standard Battery	Li-ion, 3.7V 830mAh	
Talk time	Up to 200min : GSM Tx Level 7	
Stand by time	Up to 200 hours (Paging Period: 5, RSSI: -85 dBm)	
Charging time	Approx. 2.5 hours	
RX Sensitivity	GSM, EGSM: -102dBm, DCS: -102dBm, PCS: -102dBm	
TX output power	GSM, EGSM: 32.5dBm(Level 5), DCS , PCS: 29.5dBm(Level 0)	
GPRS compatibility	Class 10	
SIM card type	3V,1.8V Small	
Display	MAIN : TFT 128 × 160 pixel 65K Color SUB : MONO STN 96*64	
Status Indicator	Hard icons. Key Pad 0 ~ 9, #, *, Up/Down/Left/Right/Ok Navigation Key Menu Key, Clear Key, Back Key, Confirm Key Send Key, Volume Key, PWR Key, Camera Key, Hot Key	
ANT	Internal	
EAR Phone Jack	Yes (mono)	
PC Synchronization	Yes	
Speech coding	EFR/FR/HR	
Data	Yes	
Vibrator	Yes	
Loud Speaker	Yes	
Voice Recoding	Yes	
Microphone	Yes	
Speaker/Receiver	One way speaker	
Travel Adapter	Yes	
MIDI	SW MIDI (Mono SPK)	
Camera	VGA	



## 2. PERFORMANCE

### 2.2 Technical Specification

Item	Description	Specification					
1	Frequency Band	<b>GSM</b> • TX: 890 + n x 0.2 MHz • RX: 935 + n x 0.2 MHz (n=1~124) <b>PCS</b> • TX: 1850 + (n-511) x 0.2 MHz • RX: 1930+ (n-511) x 0.2 MHz (n=512~810) <b>DCS</b> • TX: 1710 + (n-511) x 0.2 MHz • RX: 1805 + (n-511) x 0.2 MHz (n=512~885)					
2	Phase Error	RMS < 5 degrees Peak < 20 degrees					
3	Frequency Error	< 0.1 ppm					
4	Power Level	<b>GSM</b>					
		Level	Power	Toler.	Level	Power	Toler.
		5	33 dBm	±2dB	13	17 dBm	±3dB
		6	31 dBm	±3dB	14	15 dBm	±3dB
		7	29 dBm	±3dB	15	13 dBm	±3dB
		8	27 dBm	±3dB	16	11 dBm	±5dB
		9	25 dBm	±3dB	17	9 dBm	±5dB
		10	23 dBm	±3dB	18	7 dBm	±5dB
		11	21 dBm	±3dB	19	5 dBm	±5dB
		12	19 dBm	±3dB			
		<b>DCS/PCS</b>					
		Level	Power	Toler.	Level	Power	Toler.
		0	30 dBm	±2dB	8	14 dBm	±3dB
		1	28 dBm	±3dB	9	12 dBm	±4dB
		2	26 dBm	±3dB	10	10 dBm	±4dB
		3	24 dBm	±3dB	11	8 dBm	±4dB
		4	22 dBm	±3dB	12	6 dBm	±4dB
		5	20 dBm	±3dB	13	4 dBm	±4dB
		6	18 dBm	±3dB	14	2 dBm	±5dB
7	16 dBm	±3dB	15	0 dBm	±5dB		

## 2. PERFORMANCE

Item	Description	Specification	
5	Output RF Spectrum (due to modulation)	<b>GSM, EGSM</b>	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-63
		3,000~ <6,000	-65
		6,000	-71
		<b>DCS/PCS</b>	
		Offset from Carrier (kHz).	Max. dBc
		100	+0.5
		200	-30
		250	-33
		400	-60
		600~ <1,200	-60
		1,200~ <1,800	-60
		1,800~ <3,000	-65
		3,000~ <6,000	-65
		6,000	-73
6	Output RF Spectrum (due to switching transient)	<b>GSM, EGSM</b>	
		Offset from Carrier (kHz)	Max. (dBm)
		400	-19
		600	-21
		1,200	-21
		1,800	-24

## 2. PERFORMANCE

Item	Description	Specification		
6	Output RF Spectrum (due to switching transient)	<b>DCS/PCS</b>		
		Offset from Carrier (kHz).		Max. (dBm)
		400		-22
		600		-24
		1,200		-24
		1,800		-27
7	Spurious Emissions	Conduction, Emission Status		
8	Bit Error Ratio	<b>GSM, EGSM</b> BER (Class II) < 2.439% @-102 dBm		
		<b>DCS,PCS</b> BER (Class II) < 2.439% @-102 dBm		
9	RX Level Report Accuracy	$\pm 3$ dB		
10	SLR	$8 \pm 3$ dB		
11	Sending Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	0	-12
		1,000	0	-6
		2,000	4	-6
		3,000	4	-6
		3,400	4	-9
		4,000	0	-
12	RLR	$2 \pm 3$ dB		
13	Receiving Response	Frequency (Hz)	Max.(dB)	Min.(dB)
		100	-12	-
		200	0	-
		300	2	-7
		500	*	-5
		1,000	0	-5
		3,000	2	-5
		3,400	2	-10
		4,000	2	
		* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.		

## 2. PERFORMANCE

Item	Description	Specification	
14	STMR	$13 \pm 5$ dB	
15	Stability Margin	> 6 dB	
16	Distortion	dB to ARL (dB)	Level Ratio (dB)
		-35	17.5
		-30	22.5
		-20	30.7
		-10	33.3
		0	33.7
		7	31.7
		10	25.5
17	Side Tone Distortion	Three stage distortion < 10%	
18	System frequency (13 MHz) tolerance	$\leq 2.5$ ppm	
19	32.768KHz tolerance	$\leq 30$ ppm	
20	Ringer Volume	At least 65 dBspl under below conditions: 1. Ringer set as ringer. 2. Test distance set as 50 cm	
21	Charge Current	Fast Charge : < 600 mA Slow Charge : < 120 mA	
22	Antenna Display	Antenna Bar Number	Power
		5	-85 dBm ~
		4	-90 dBm ~ -86 dBm
		3	-95 dBm ~ -91 dBm
		2	-100 dBm ~ -96 dBm
		1	-105 dBm ~ -101 dBm
		0	~ -105 dBm
23	Battery Indicator	Battery Bar Number	Voltage
		0	3.56V ~ 0.05 V
		1	3.66V ~ 0.05 V
		2	3.74V ~ 0.05 V
		3	3.85V ~ 0.05 V
		4	3.86V ~ 0.05 V ~
24	Low Voltage Warning	$3.56 \pm 0.05$ V (Call) every 1 minutes	
		$3.50 \pm 0.05$ V (Standby)	

## 2. PERFORMANCE

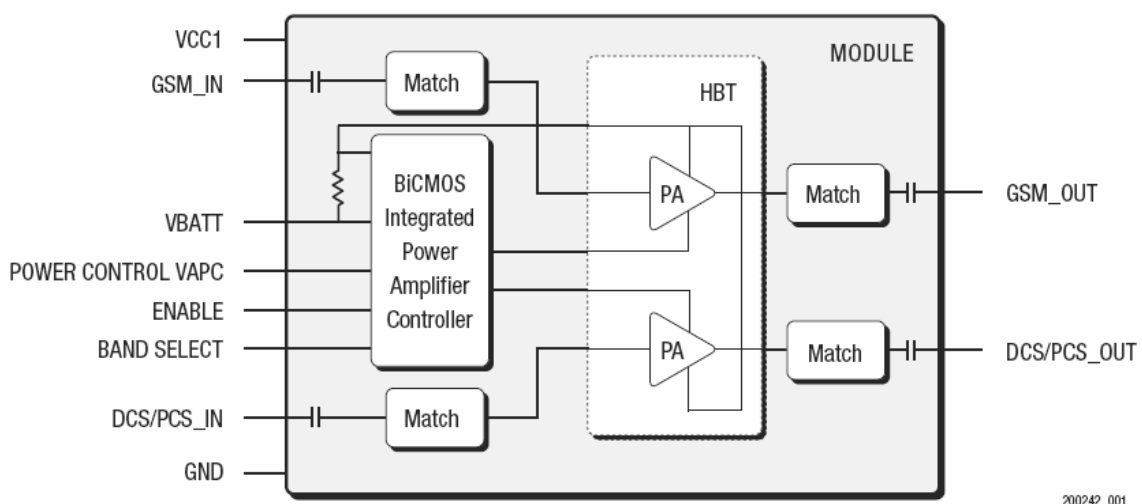
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Item	Description	Specification
25	Forced shut down Voltage	$3.35 \pm 0.03V$
26	Battery Type	1 Li-ion Battery Standard Voltage = 3.7 V Battery full charge voltage = 4.2 V Capacity: 830mAh
27	Travel Charger	Switching-mode charger Input: 100 ~ 240 V, 50/60 Hz Output: 5.2 V, 800 mA

## 3. TECHNICAL BRIEF

### 3.1 Power Amplifier (SKY77318, U500)

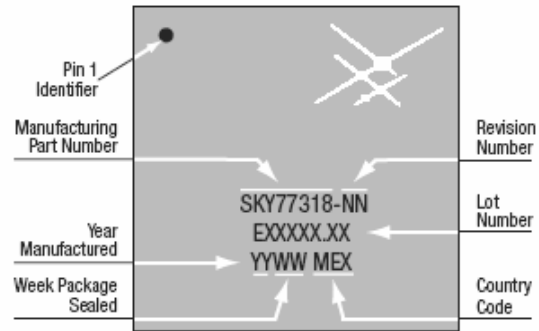
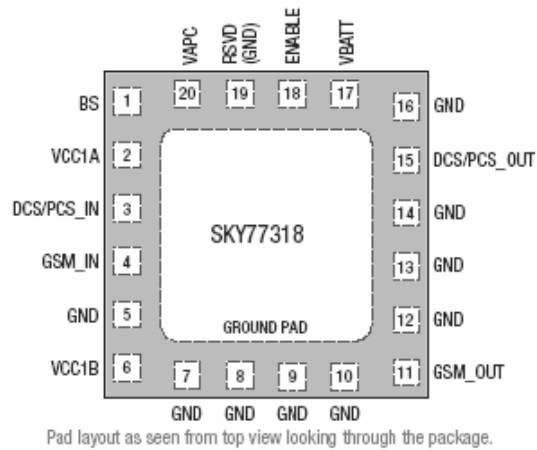
The SKY77318 Power Amplifier Module (PAM) is designed in a low profile (1.2 mm), compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, and PCS1900 operation. The PAM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation. The module consists of separate GSM850/900 PA and DCS1800/PCS1900 PA blocks, impedancematching circuitry for 50  $\Omega$  input and output impedances, and a Power Amplifier Control (PAC) block with an internal current-sense resistor. The custom BiCMOS integrated circuit provides the internal PAC function and interface circuitry. Fabricated onto a single Gallium Arsenide (GaAs) die, one Heterojunction Bipolar Transistor (HBT) PA block supports the GSM850/900 bands and the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pins to distribute current. The GaAs die, the Silicon (Si) die, and the passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic over mold. RF input and output ports of the SKY77318 are internally matched to a 50  $\Omega$  load to reduce the number of external components for a quad-band design. Extremely low leakage current (2.5  $\mu$ A, typical) of the dual PA module maximizes handset standby time. The SKY77318 also contains band-select switching circuitry to select GSM (logic 0) or DCS/PCS (logic 1) as determined from the Band Select (BS) signal. In Figure 3.1 below, the BS pin selects the PA output (DCS/PCS OUT or GSM850/900 OUT) and the Analog Power Control (VAPC) controls the level of output power. The VBATT pin connects to an internal current-sense resistor and interfaces to an integrated power amplifier control (iPAC™) function, which is insensitive to variations in temperature, power supply, process, and input power. The ENABLE input allows initial turn-on of PAM circuitry to minimize battery drain.



200242\_001

**Figure 3.1 Functional Block Diagram**

### 3. TECHNICAL BRIEF



**SKY77318 PAM Pin Configuration-20-Pin  
Leadless (Top View)**

**Typical Case Markings**

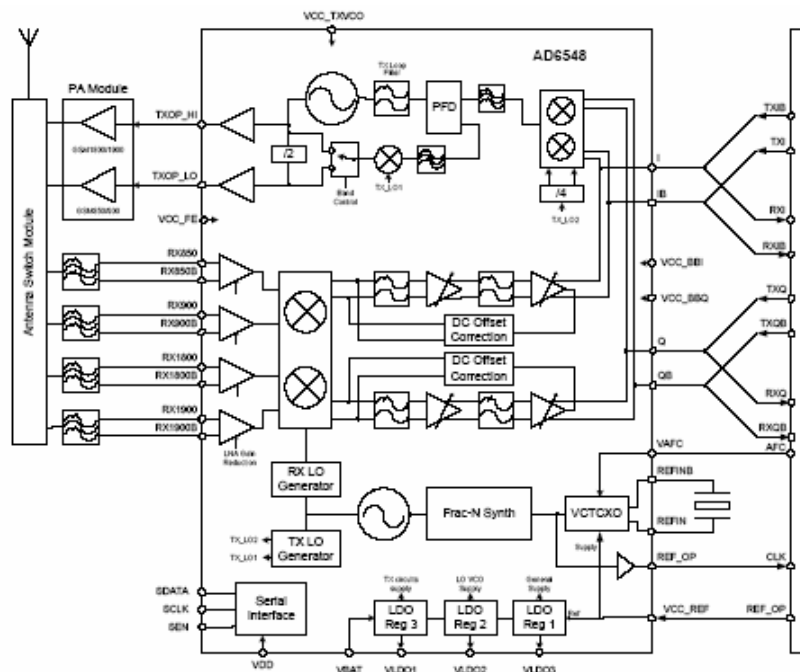
Pin	Mame	Description
1	BS	Band Select
2	VCC1A	VCC (to GSM 1st stage, DCS/PCS 1st stages, BiCMOS PAC)
3	DCS/PCS IN	RF input 1710-1910 MHz (DCS1800, PCS1900)
4	GSM IN	RF input 880-915 MHz (GSM)
5	GND	RF and DC Ground
6	VCC1B	VCC (to GSM 2nd stage, DCS/PCS 2nd stages)
7	GND	RF and DC Ground
8	GND	RF and DC Ground
9	GND	RF and DC Ground
10	GND	RF and DC Ground
11	GSM OUT	RF Output 880-915 MHz (GSM)
12	GND	RF and DC Ground
13	GND	RF and DC Ground
14	GND	RF and DC Ground
15	DCS/PCS_OUT	RF Output 1710-1910 MHz (DCS 1800, PCS1900)
16	GND	RF and DC Ground
17	VBATT	Battery input to high side of internal sense resistor
18	ENABLE	BiCMOS Enable
19	RSVD(GND)	RF and DC Ground
20	VAPC	Power Control Bias Voltage
GMD PAD	GND	Ground Pad, device underside

**Table 4. SKY77318 Pin Names and Signal Descriptions**

## 3.2 Transceiver (AD6548, U501)

The AD6548 provides a highly integrated direct conversion radio solution that combines, on a single chip, all radio and power management functions necessary to build the most compact GSM radio solution possible. The only external components required for a complete radio design are the Rx SAWs, PA, Switchplexer and a few passives enabling an extremely small cost effective GSM Radio solution. The AD6548 uses the industry proven direct conversion receiver architecture of the Othello™ family. For Quad band applications the front end features four fully integrated programmable gain differential LNAs. The RF is then down converted by quadrature mixers and then fed to the baseband programmable-gain amplifiers and active filters for channel selection. The Receiver output pins can be directly connected to the baseband analog processor. The Receive path features automatic calibration and tracking to remove DC offsets.

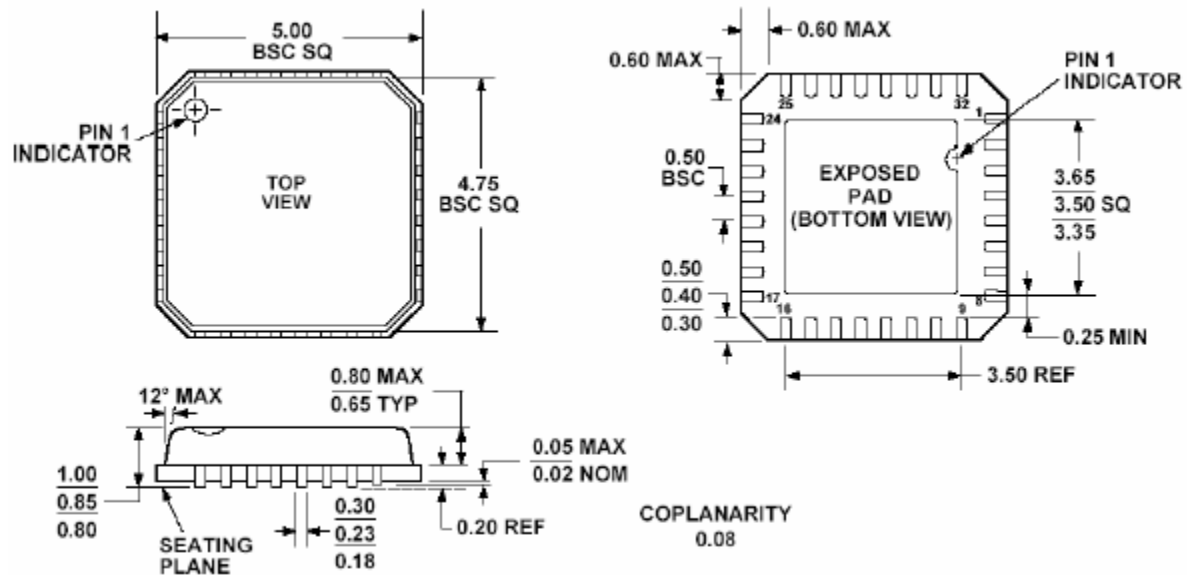
The transmitter features a translation-loop architecture for directly modulating baseband signals onto the integrated TX VCO. The translation-loop modulator and TX VCO are extremely low noise removing the need for external SAW filters prior to the PA. The AD6548 uses a single integrated LO VCO for both the receive and the transmit circuits. The synthesizer lock times are optimized for GPRS applications up to and including class 12. AD6548 incorporates a complete reference crystal calibration system. This allows the external VCTCXO to be replaced with a low cost crystal. No other external components are required. The AD6548 uses the traditional VCTCXO reference source. The AD6548 also contains on-chip low dropout voltage regulators (LDOs) to deliver regulated supply voltages to the functions on chip, with a battery input voltage of between 2.9V and 5.5V. Comprehensive power down options are included to minimize power consumption in normal use. A standard 3 wire serial interface is used to program the IC. The interface features low-voltage digital interface buffers compatible with logic levels from 1.6V to 2.9V.



**Figure 3.2 AD6548 Block Diagram**



### 3. TECHNICAL BRIEF



COMPLIANT TO JEDEC STANDARDS MO-220-VHHD-2

#### AD6548/9 Pin Descriptions

No	Name	Description	No	Name	Description
1	VCC_FE	Front end supply (IP)	17	VCC_REF	Reference Oscillator Supply (IP)
2	I	I baseband input/output	18	VAFC/ N/C	AD6548 Crystal Freq control (IP) AD6549: Spare Pin
3	IB	I baseband input/output	19	REFIN	Crystal Connection
4	VCC_BBI	Baseband I, TX path supply (IP)	20	REFINB	Crystal Connection
5	SDATA	Serial port data	21	REF_OP	Reference Frequency Output
6	SCLK	Serial port clock	22	QB	Q baseband input/output
7	SEN	Serial port enable	23	Q	Q baseband input/output
8	N/C	Not connected	24	VCC_BBQ	Baseband Q supply (IP)
9	VLDO3	TX LDO Output (1)	25	RX1900B	PCS 1900 LNA input
10	TXOP_LO	Transmit O/P (850/900MHz)	26	RX1900	PCS 1900 LNA input
11	TXOP_HI	Transmit O/P (1800/1900MHz)	27	RX1800B	DCS 1800 LNA input
12	VCC_TXVCO	TX VCO supply (1)	28	RX1800	DCS 1800 LNA input
13	VDD	Serial interface supply	29	RX900B	E-GSM LNA input
14	VBAT	Battery I/P for LDO reg's	30	RX900	E-GSM LNA input
15	VLDO1	LDO regulator Output (2)	31	RX850B	GSM 850 LNA input
16	VLDO2	LO VCO Supply (3)	32	RX850	GSM 850 LNA input

Notes:

1. Supply regulated by internal LDO3 and should not be connected to any other supply
2. Internally connected as Synth supply (Counters + SDM + Charge pump)
3. Supply regulated by internal LDO2 and should not be connected to any other supply

### 3.3 FEM for Triband

	Tx 900	Tx 1800/1900	RX EGSM	RX DCS	RX PCS
Vdd	H	H	H	H	H
Vctrl1	H	H	L	L	L
Vctrl2	L	H	H	L	L
Vctrl3	L	L	L	H	L

Table 3.3.1 Band SW Logic Table

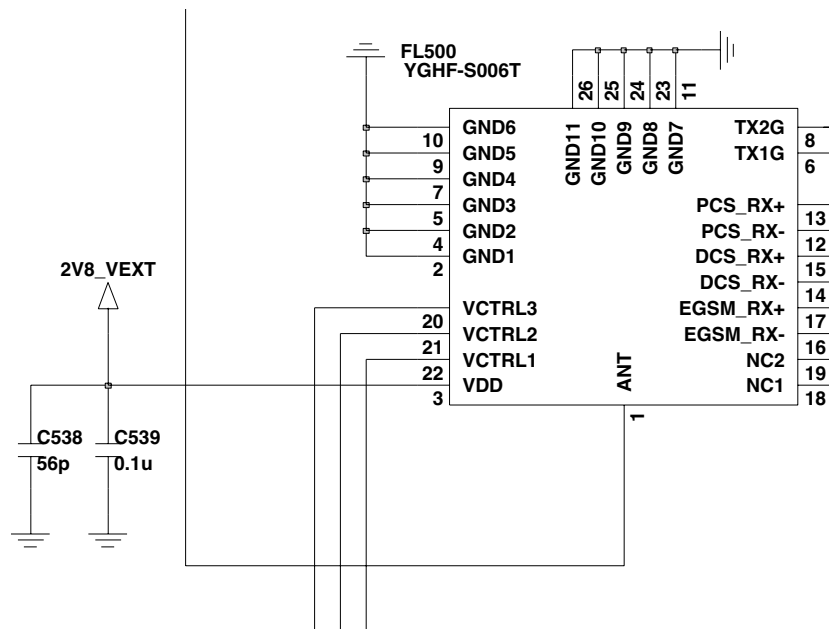


Figure 3.3.1 FEM CIRCUIT DIAGRAM

### 3. TECHNICAL BRIEF

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#### 3.4 26 MHz Clock (Crystal, X500)

The 26 MHz clock (X500) consists of a XO( Crystal Oscillator) which oscillates at a frequency of 26 MHz. The AD6548 requires only an external low cost crystal as the frequency reference. The circuitry to oscillate the crystal and tune its frequency is fully integrated. The Oscillator is a balanced implementation requiring the crystal to be connected across 2 pins. There is a programmable capacitor array included for coarse tuning of fixed offsets (e.g. crystal manufacturing tolerance), and an integrated varactor for dynamic control. The oscillator is designed for use with a 26MHz crystal. Dedicated control software ensures excellent frequency stability under all circumstances.

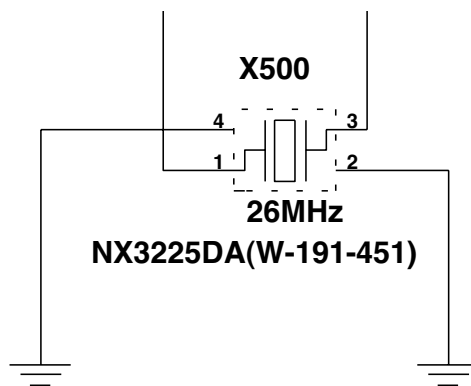
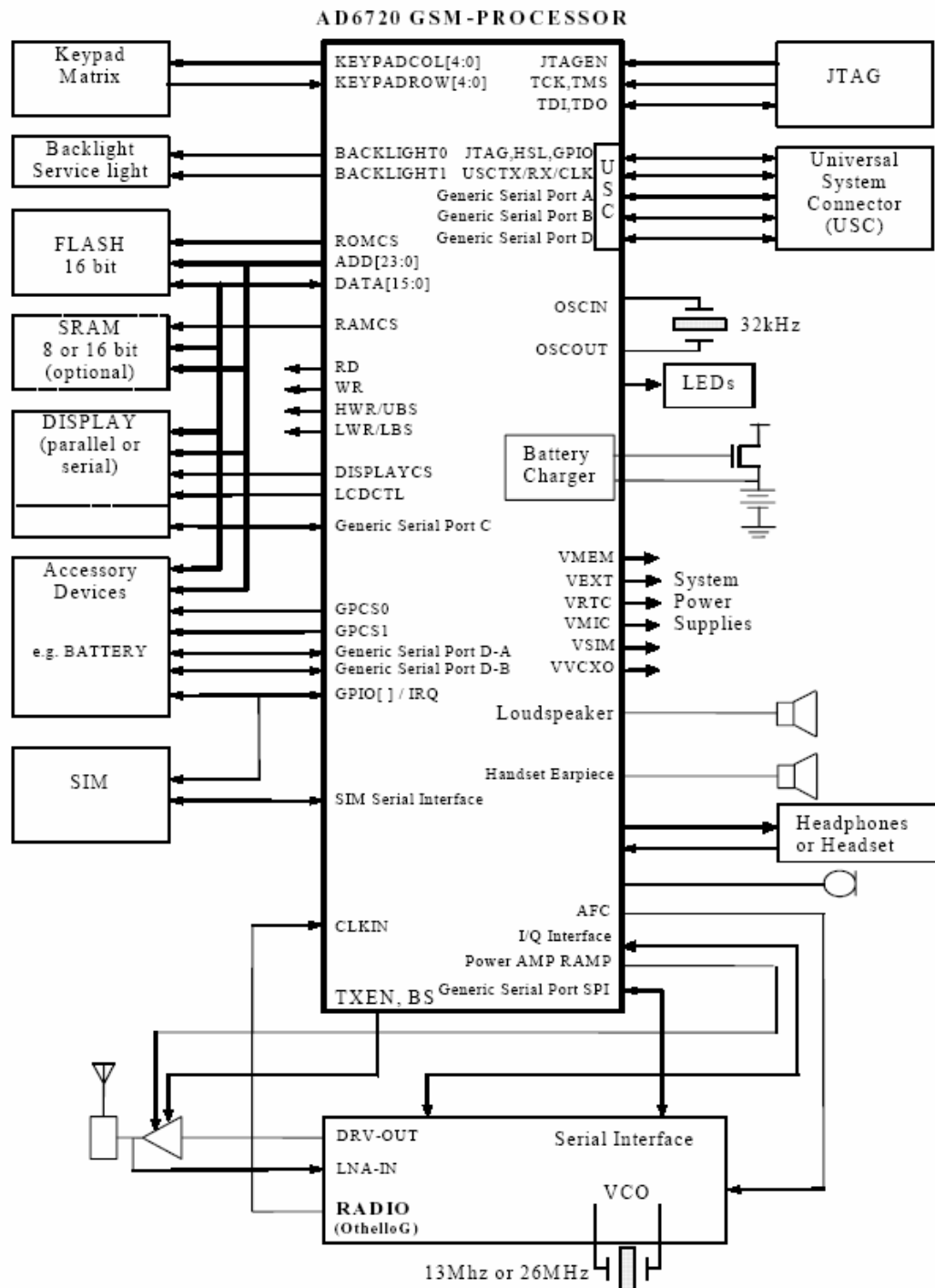


Figure 3.4 CRYSTAL CIRCUIT DIAGRAM

### 3.5 Baseband Processor (AD6720 , U104)

- AD6720 is an ADI designed processor
- AD6720 consists of
  1. Control Processor Subsystem including:
    - 32-bit MCU ARM7TDMI® Control Processor
    - 39 MHz operation at 1.8V
    - 1Mb of on-chip System SRAM Memory
  2. DSP Subsystem including:
    - 16-bit Fixed Point DSP Processor
    - 91 MIPS[1] at 1.8V
    - Data and Program SRAM
    - Program Instruction Cache
    - Full Rate, Enhanced Full Rate and Half Rate
    - Speech Encoding/Decoding
    - Capable of Supporting AMR & PDC Speech Algorithms
  3. Peripheral Functions
    - Parallel and Serial Display Interface
    - Keypad Interface
    - Flash Memory Interface
    - Page-Mode Flash Support
    - 1.8V and 3.0V, 64 kbps SIM Interface
    - Universal System Connector Interface
    - Data Services Interface
    - Battery Interface (e.g. Dallas)
  4. Other
    - Supports 13 MHz and 26 MHz Input Clocks
    - 1.8V Typical Core Operating Voltages
    - 289-Ball Package (12x12mm) , 0.65mm Ball pitch
  5. The AD6720 baseband transmit section supports the following
    - mobile station GMSK modulation power classes:
      - GSM 900/850 power classes 4 and 5,
      - DCS 1800 power classes 1 and 2, and
      - PCS 1900 power classes 1 and 2

### 3. TECHNICAL BRIEF



**Figure 3.5 SYSTEM INTERCONNECTION OF AD6720 EXTERNAL INTERFACE**

### 3.5.1 Interconnection with external devices

#### A. RTC block interface

Countered by external X-TAL

The X-TAL oscillates 32.768KHz

#### B. LCD module interface

The LCD module is controlled by CAMERA IC, AIT701G

If AIT701G is in the state of by-pass mode, the LCD control signals from AD6720 are by-passed through AIT701G.

In operating mode, the AIT701G controls the LCD module through L\_MAIN\_LCD\_CS, L\_SUB\_LCD\_CS, LCD\_RESET, LCD\_RS, LCD\_WR, LCD\_RD, L\_DATA[15-00], 2V8\_VCAM, IF\_MODE, LCD\_ID[1:3].

Signals	Description
L_MAIN_LCD_CS	MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
L_SUB_LCD_CS	SUB LCD driver chip enable. SUB LCD driver IC has own CS pin
LCD_ID1	Select LCD module maker(2.4V : NEODIS, 0V : LGIT)
LCD_RESET	This pin resets LCD module. This signal comes from AD6720 directly.
LCD_WR	Enable writing to LCD Driver.
LCD_RD	Enable reading to LCD Driver.
LCD_RS	This pin determines whether the data to LCD module are display data or control data. LCD_RS can select 16 bit parallel bus.
2V8_CAM	2.8V voltage is supplied to LCD driver IC.
IF_MODE	Select 16bits or 8bits interface mode for MAIN LCD. For the future

**Table 3.5.B LCD CONTRON SIGNALS DISCRIPTION**

### 3. TECHNICAL BRIEF

---

The backlight of LCD module is controlled by AD6720 via AAT3157.  
The control signals related to Backlight LED are given bellow.

Signals	Description
MLED	Current source for backlight LED
LCD_DIM_CTL	Control LCD backlight level in 16 steps
MLED[1:3]	This pins are returned-paths for backlight LED current source (MLED)

**Table 3.5.B2 DESCRIPTION OF LCD BACKLIGHT LED CONTROL**

#### **C. RF interface**

The AD6720 control RF parts through PA\_BAND, ANT\_SW1, ANT\_SW2, ANT\_SW3 , CLKON, PA\_EN, S\_EN, S\_DATA, S\_CLK

Signals	Description
PA_BAND (GPO 17)	PAM Band Select
ANT_SW1 (GPO 9)	Antenna switch Band Select
ANT_SW2 (GPO 10)	Antenna switch Band Select
PA_EN (GPO 16)	PAM Enable/Disable
S_EN (GPO 19)	PLL Enable/Disable
S_DATA (GPO 20)	Serial Data to PLL
S_CLK (GPO 21)	Clock to PLL

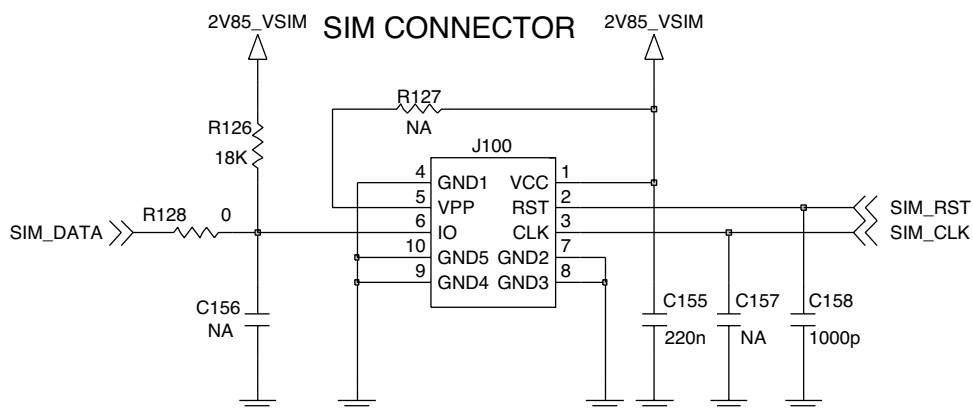
**Table 3.5.C RF CONTROL SIGNALS DESCRIPTION**

#### D. SIM interface

The AD6720 provides SIM Interface Module. The AD6720 checks status periodically during established call mode whether SIM card is inserted or not, but it doesn't check during deep Sleep mode. In order to communicate with SIM card, 3 signals SIM\_DATA, SIM\_CLK, SIM\_RST(GPIO\_23) are required. The descriptions about the signals are given by bellow Table 3-5 in detail.

Signals	Description
SIM_DATA	This pin receives and sends data to SIM card. This model can support 3.0 volt and 1.8 volt interface SIM card.
SIM_CLK	Clock 3.25MHz frequency.
SIM_RST (GPIO_23)	Reset SIM block

**Table 3.5.D SIM CONTROL SIGNALS DESCRIPTION**



**Figure 3.5.D2 SIM Interface of AD6720**



### 3. TECHNICAL BRIEF

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#### E. LDO Block

There are 8 LDOs in the AD6720.

- VCORE : supplies Digital baseband Processor core and AD6720 digital core(1.8V, 80mA)
- VMEM : supplies external memory and the interface to the external memory on the digital baseband processor (2.8V, 150mA)
- VEXT : supplies Radio digital interface and high voltage interface (2.8V, 200mA)
- VSIM : supplies the SIM interface circuitry on the digital processor and SIM card (2.85V, 1.8V, 20mA)
- VRTC : supplies the Real-Time Clock module (1.8 V, 20  $\mu$ A)
- VABB : supplies the analog portions of the AD6720
- VMIC : supplies the microphone interface circuitry (2.5 V, 2 mA)
- VVCXO : supplies the voltage controlled crystal oscillator ( 2.75 V, 10 mA)

#### F. Battery Charging Block

1. It can be used to charge Lithium Ion batteries.

Charger initialization, trickle charging, and Li-Ion charging control are implemented in hardware.

2. Charging Process

- Check charger is inserted or not
- If AD6720 detects that Charger is inserted, the CC-CV charging starts.
- Exception : When battery voltage is lower than 3.2V, the precharge (low current charge mode) starts firstly.
- And the battery voltage reach to 3.2V the CC-CV charging starts.

3. Pins used for charging

- VCHG : charger supply.
- GATEDRIVE : charge DAC output
- ISENSE : charge current sense input
- VBATSENSE : battery voltage sense input.
- BATTYPE : battery type identification input
- REFCHG : voltage reference output

4. TA (Travel Adaptor)

- Input voltage: AC 100V ~ 2400V, 50~60Hz
- Output voltage: DC 5.2V
- Output current: Max 800mA

5. Battery

- Li-ion battery (Max 4.2V, Nom 3.7V)
- Standard battery: Capacity - 830mAh

CHARGE

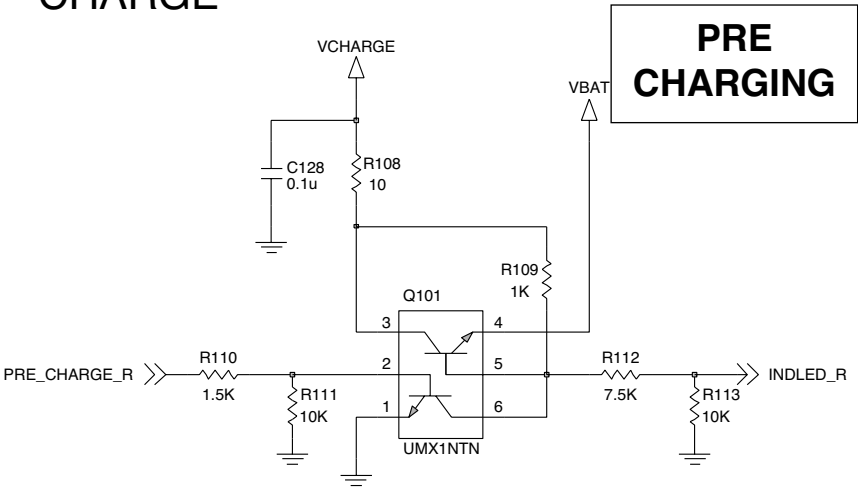


Figure 3.5.F1 CIRCUIT FOR BATTERY CHARGING

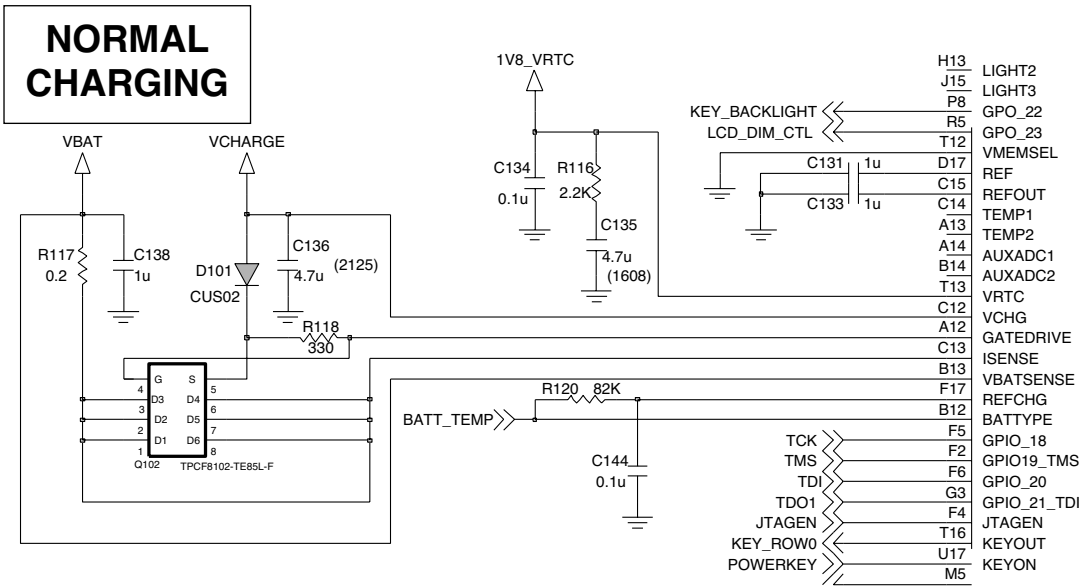


Figure 3.5.F2 CIRCUIT FOR BATTERY CHARGING

### 3. TECHNICAL BRIEF

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#### 3.6 Display and Interface

• Main LCD

Properties	Spec.	Unit
Active Screen Size	28.032mm(W) x 35.04mm(H)	mm
Color Depth	262,144	colors
Resolution	128 x RGB x 160	dots

• Sub LCD

Properties	Spec.	Unit
Active Screen Size	18.902mm(W) x 13.43mm(H)	mm
Color Depth	2	colors
Resolution	96 x 64 (mono) Pixels	dots

Controlled by L\_MAIN\_LCD\_CS, L\_SUB\_LCD\_CS, LCD\_RESET, LCD\_RS, LCD\_WR, LCD\_RD, IFMODE, L\_DATA[00:15] ports

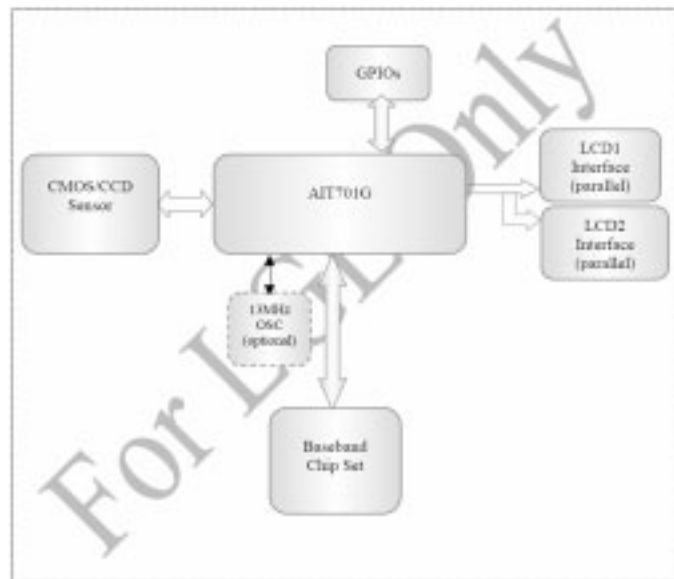
- L\_MAIN\_LCD\_CS : MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
- LCD\_RESET : This pin resets LCD module. This signal comes from AD6720 directly.
- LCD\_RS: This pin determines whether the data to LCD module are display data or control data.
- LCD\_WR : Write control Signal
- LCD\_RD : Read control Signal. But this pin used only for debugging.
- L\_DATA[00:15] : Parallel data lines.
- LCD\_ID[1:2] : LCD type selection signals
  - LCD\_ID1 : LCD maker(2.4V is NEODIS, 0V is LGIT)
  - LCD\_ID[2:3] : for the future using
- For using 262K color, data buses should be 16 bits.



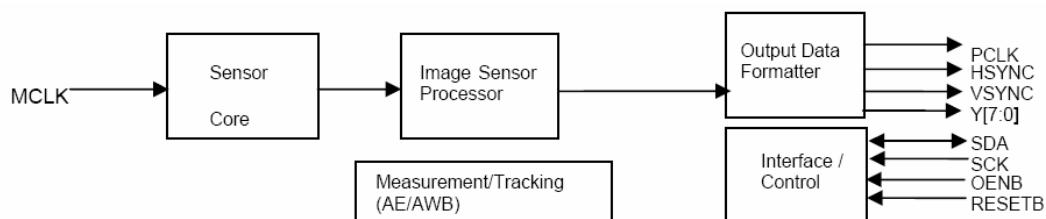
### 3. TECHNICAL BRIEF

#### 3.7 Camera Interface(AIT701G , U402)

This model has a built-in VGA(640 x 480) camera module. And the camera produces JPG pictures. Camera module is controlled by AIT701G. Interface is done by I2C and YCbCr format. I2C is a control signal and YCbCr is real data interface signal.

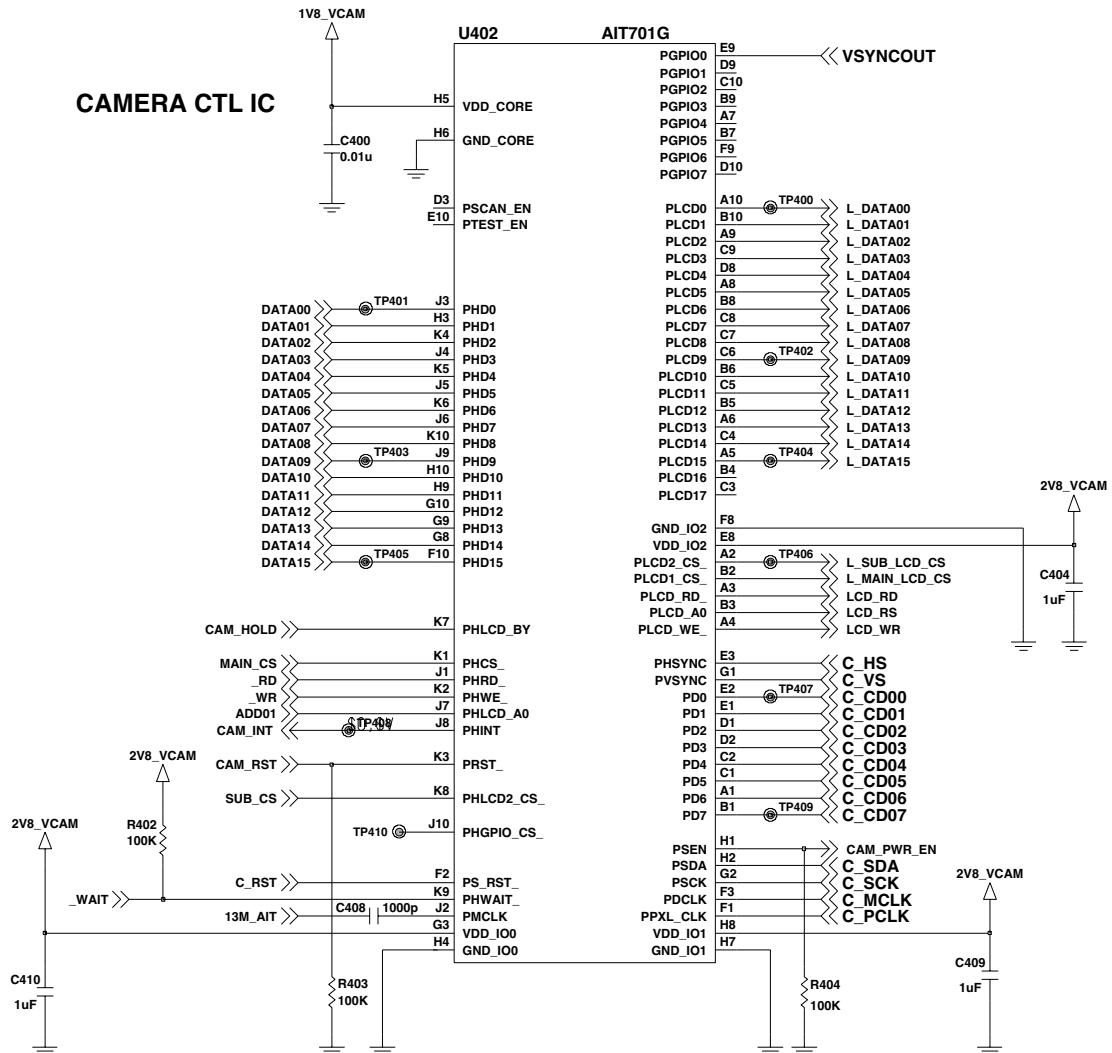


**Figure 3.7.1 AIT701G BLOCK DIAGRAM**



**Figure 3.7.2 SENSOR CHIP BLOCK DIAGRAM**

### 3. TECHNICAL BRIEF

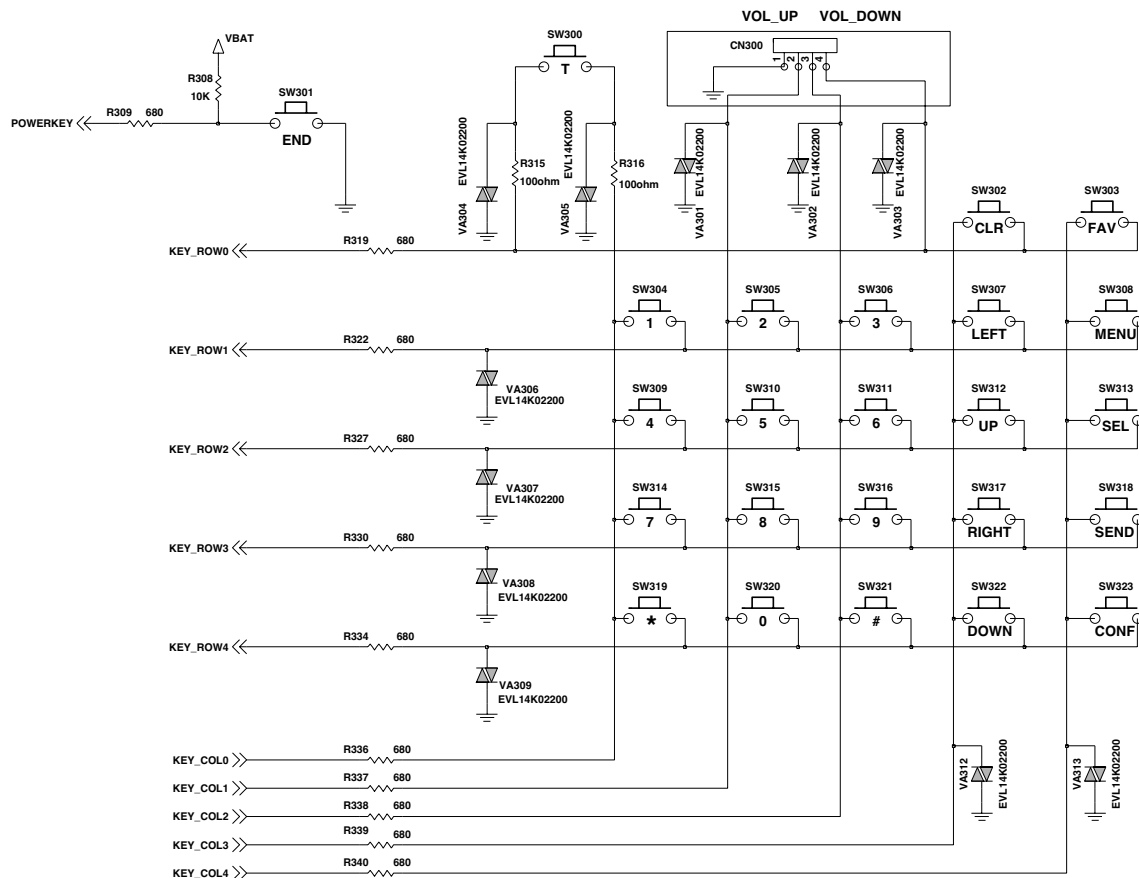


**Figure 3.7.3 AIT701G CIRCUIT**

### 3. TECHNICAL BRIEF

## 3.8 Keypad Switches and Scanning

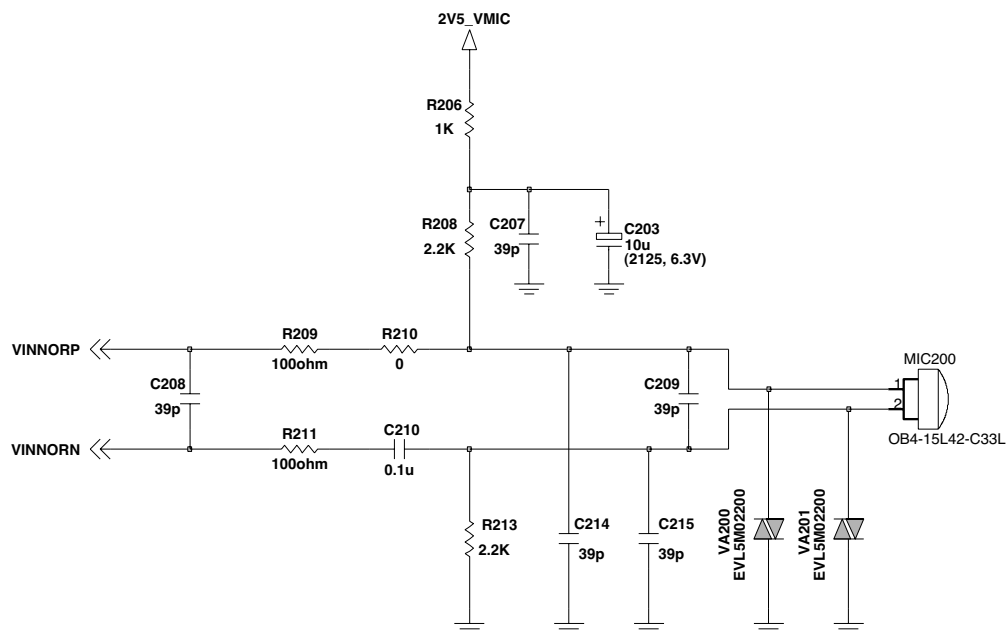
The key switches are metal domes, which make contact between two concentric pads on the keypad layer of the PCB when pressed. There are 26 switches (Normal Key 24EA, Volume up down side key, PWR down side key), connected in a matrix of 5 rows by 5 columns, as shown in Figure 3-11, except for the power switch (SW301), which is connected independently. Functions, the row and column lines of the keypad are connected to ports of AD6720. The columns are outputs, while the rows are inputs and have pull-up resistors built in. When a key is pressed, the corresponding row and column are connected together, causing the row input to go low and generate an interrupt. The columns/rows are then scanned by AD6720 to identify the pressed key.



**Figure 3.8 Keypad Switches and Scanning**

### 3.9 Microphone

The microphone is placed to the Front cover and contacted to main PCB. The audio signal is passed to VINNORP and VINNORN pins of AD6720. The voltage supply VMIC is output from AD6720, and is a biased voltage for the VINNORP. The VINNORP and VINNORN signals are then A/D converted by the voice band ADC part of AD6720. The digitized speech (PCM 8KHz ,16KHz) is then passed to the DSP section of AD6720 for processing (coding, interleaving etc).

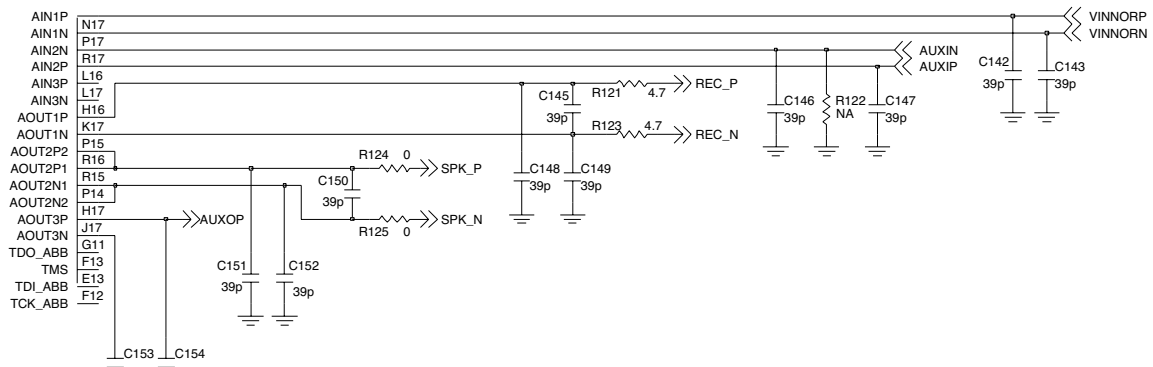


**Figure 3.9 Connection between Microphone and AD6720**

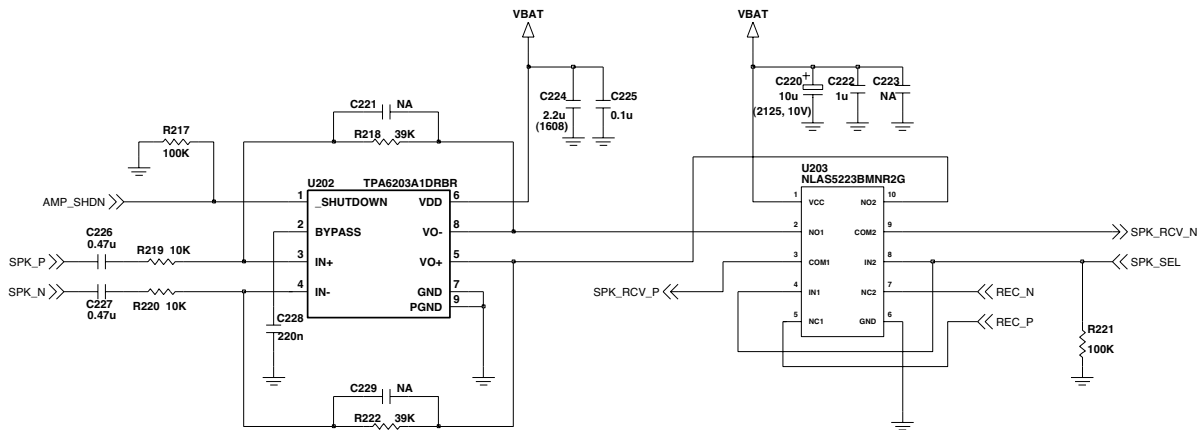


### 3. TECHNICAL BRIEF

#### 3.10 Main Speaker



#### ACOUSTIC & MIDI



**Figure 3.10 Connection between Speaker, Amp and AD6720**

### 3.11 Headset Interface

This phone has 6 electrodes such as GND, AUXIP, AUXIN (this pin is floating), AUXOP, JACK\_DETECT, HOOK\_DETECT. This type supports mono sound

#### Switching from Receiver to Headset Jack

If jack is inserted, JACK\_DETECT goes from low to high.

Audio path is switched from receiver to earphone by JACK\_DETECT interrupt.

#### Switching from Headset Jack to Receiver

If jack is removed, JACK\_DETECT goes from high to low.

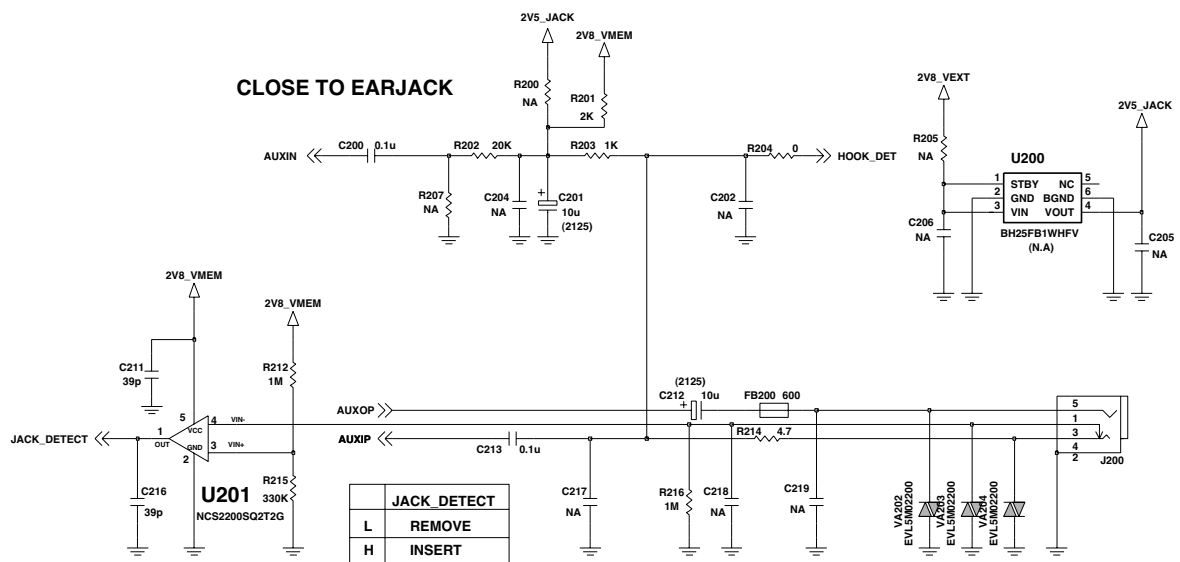
Audio path is switched from earphone to receiver by JACK\_DETECT interrupt.

#### Hook detection

If hook-button is pressed, HOOK\_DETECT is changed from high to low.

This is detected by GPIO\_6.

And then hook is detected.

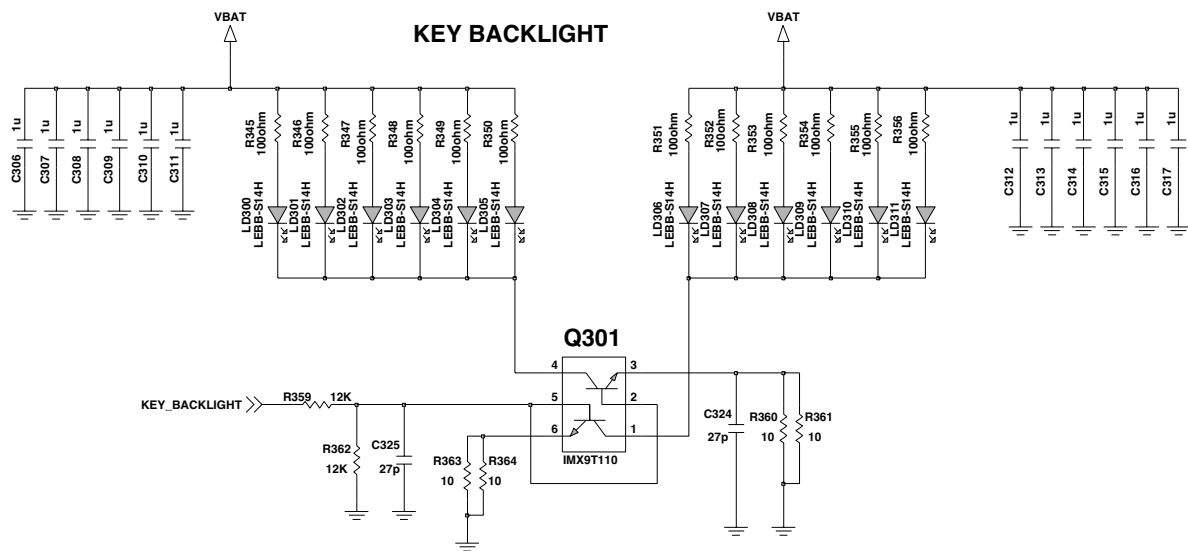


**Figure 3.11 HEADSET JACK INTERFACE**

### 3. TECHNICAL BRIEF

#### 3.12 Key Back-light Illumination

In key back-light illumination, there are 12 Blue LEDs in Main Board, which are driven by KEY\_BACKLIGHT signal from AD6720.



**Figure 3.12 KEY BACK-LIGHT ILLUMINTION**

LCD backlight LEDs is controlled by AD6720 via AAT3157, U403.



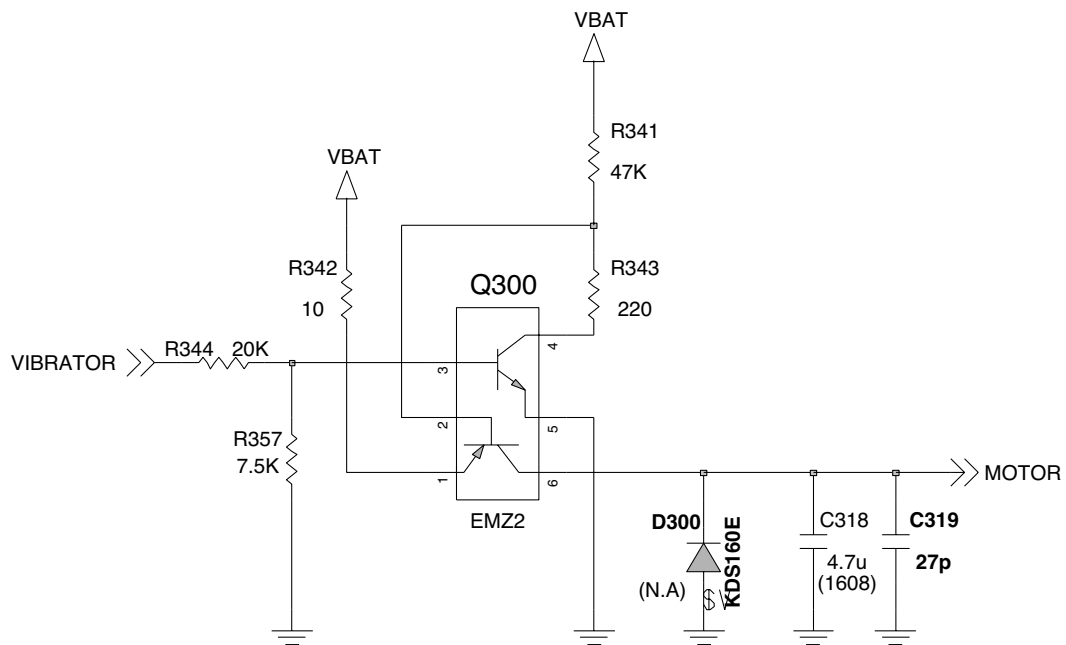
### 3. TECHNICAL BRIEF

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#### 3.14 VIBRATOR

The vibrator is placed in the folder cover and contacted to LCD MODULE. The vibrator is driven from VIBRATOR (GPIO\_0) of AD6720

## VIBRATOR

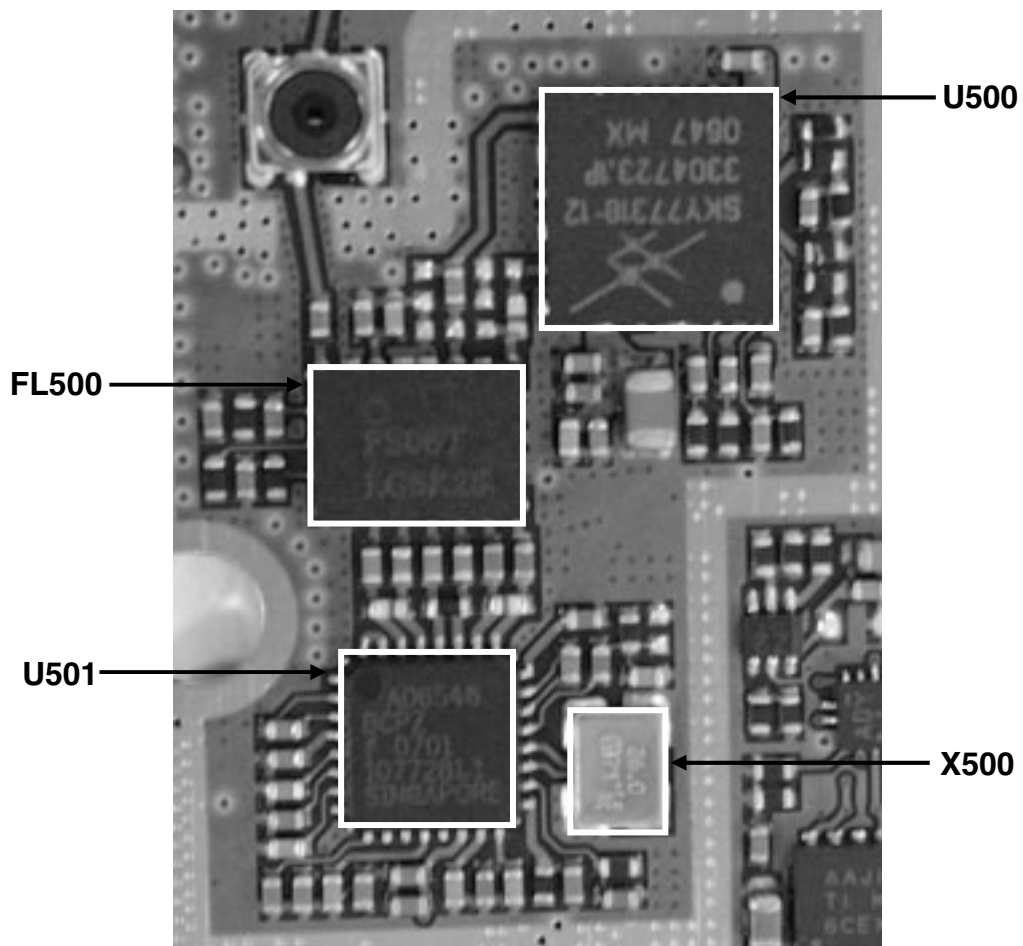


**Figure 3.14 Vibrator**

## 4. TROUBLE SHOOTING

### 4.1 RF Component

#### TEST POINT



**Figure 4.1**

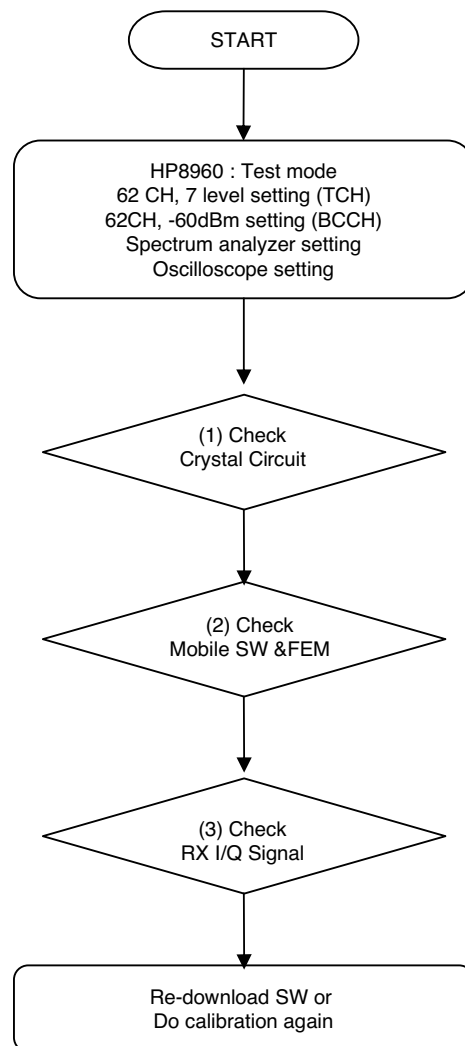
<b>U500</b>	Power Amp Module (SKY77318)
<b>U501 (AD6548)</b>	RF Main Chip (Transceiver)
<b>X500</b>	Crystal, 26MHz Clock
<b>FL500</b>	FEM

## 4. TROUBLE SHOOTING

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### 4.2 RX Trouble

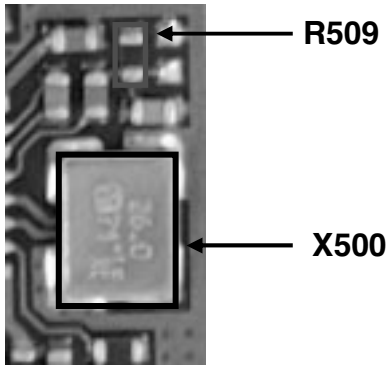
#### Checking Flow



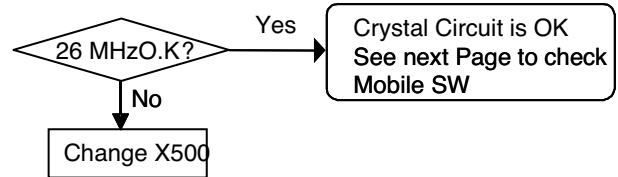
## 4. TROUBLE SHOOTING

### (1) Checking Crystal Circuit

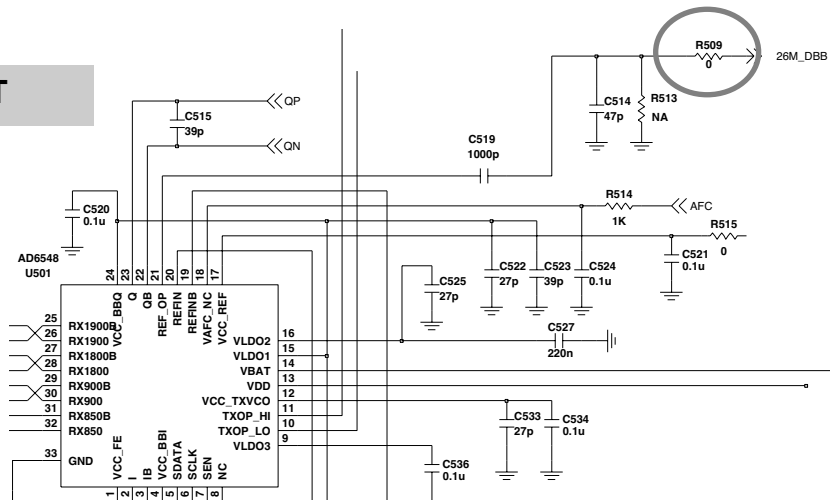
#### TEST POINT



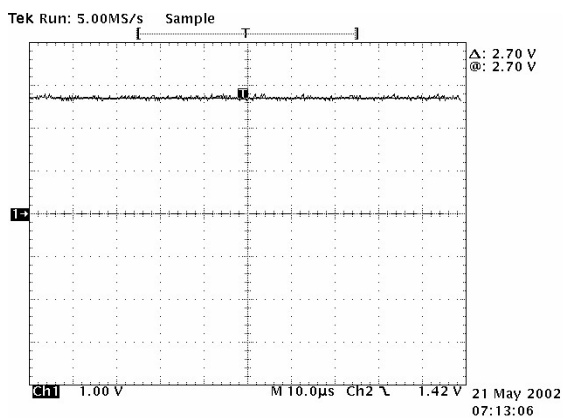
#### CHECKING FLOW



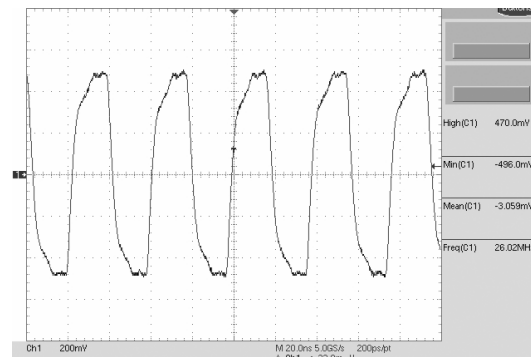
#### CIRCUIT



#### WAVEFORM



**Graph 4.2.1(a)**

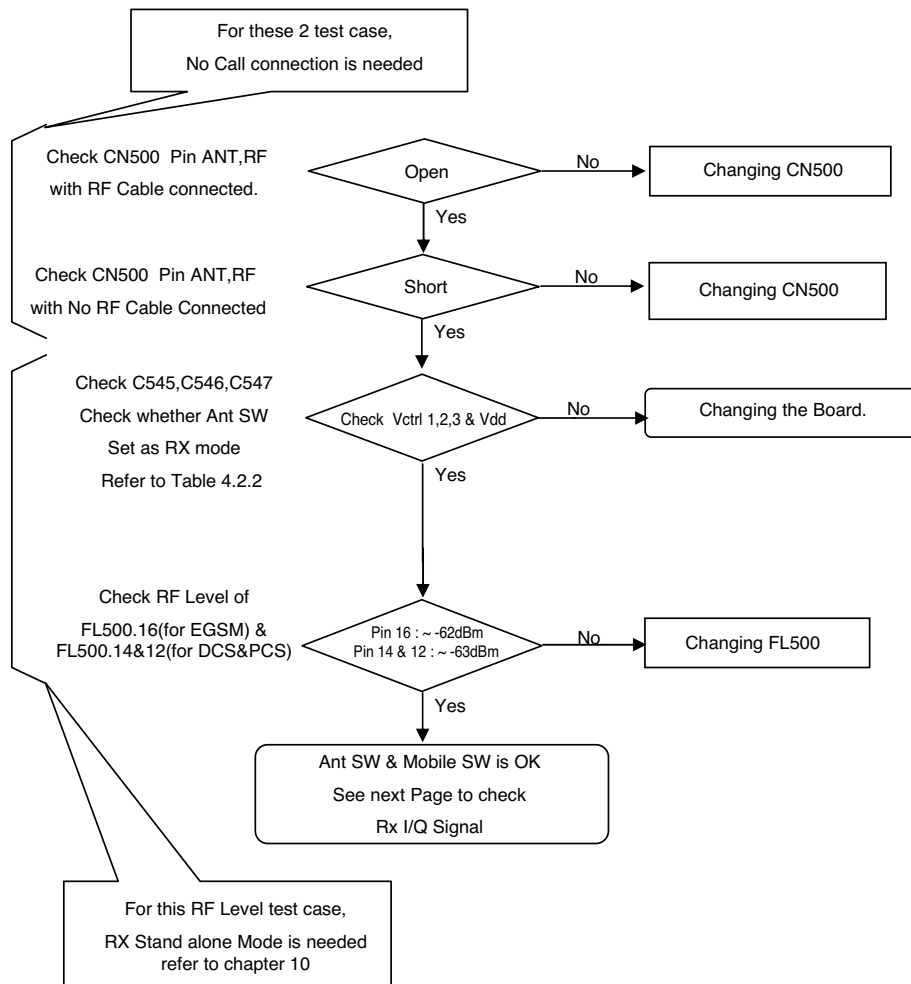


**Graph 4.2.1(b)**





### Checking Flow



RX Mode	EGSM	DCS	PCS
Vctrl 1	Off	Off	Off
Vctrl 2	On	Off	Off
Vctrl 3	Off	On	Off

**Table 4.2.2**

## 4. TROUBLE SHOOTING

### (3) Checking RX I/Q

#### TEST POINT

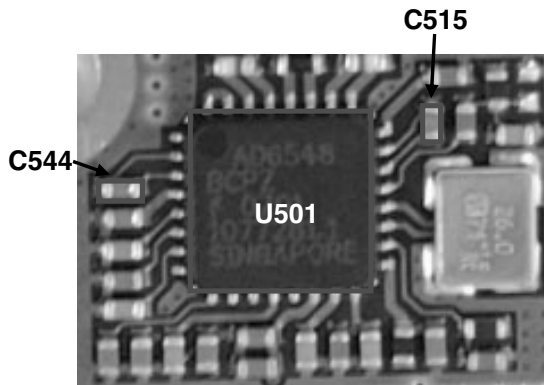
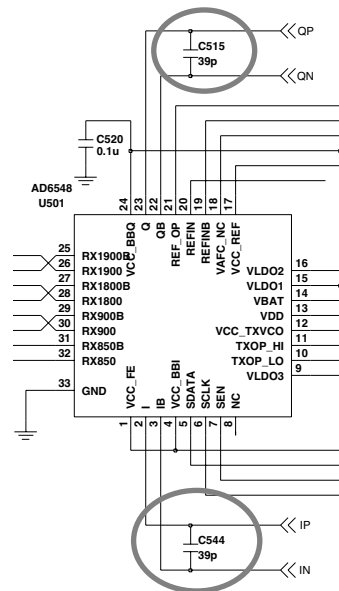
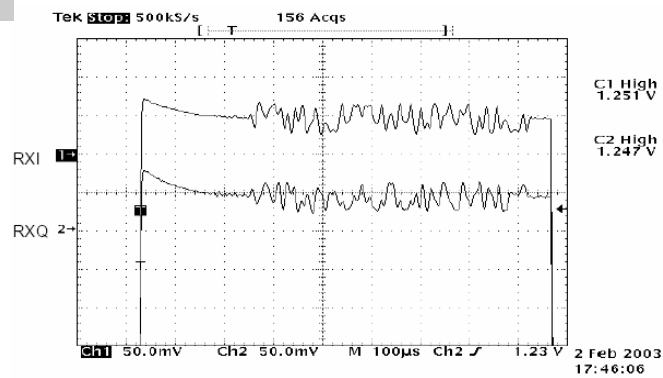


Figure 4.2.3

#### CIRCUIT



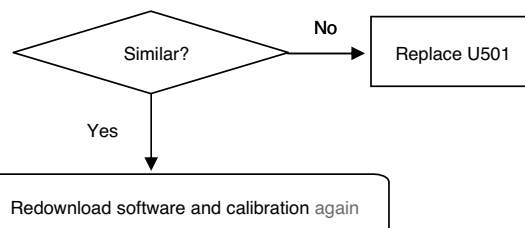
#### WAVEFORM



Graph 4.2.3

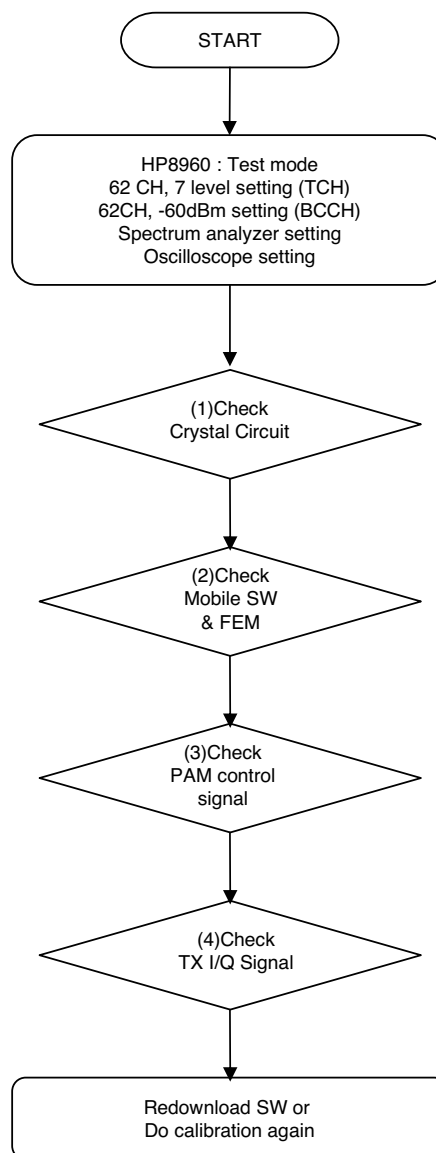
#### CHECKING FLOW

Check C515, C544.  
Check if there is any  
Major difference  
Refer to graph 4.2.3



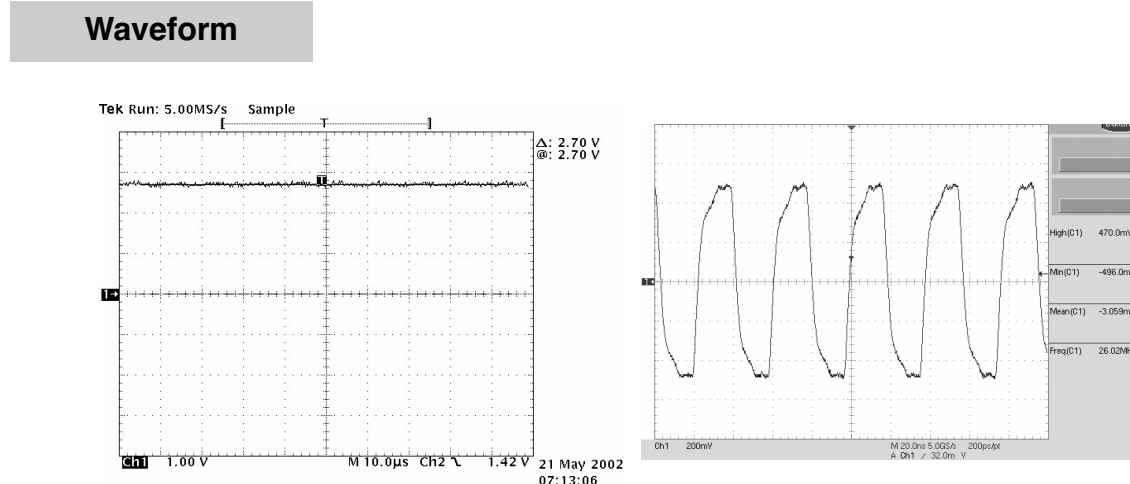
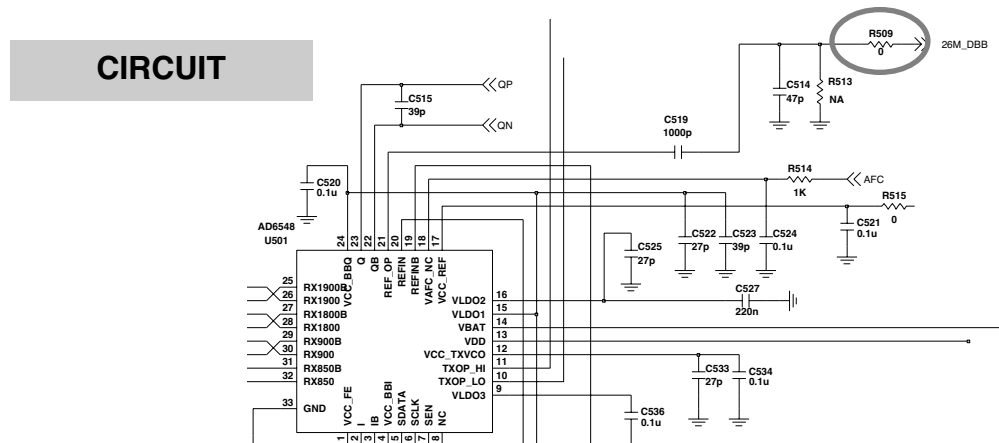
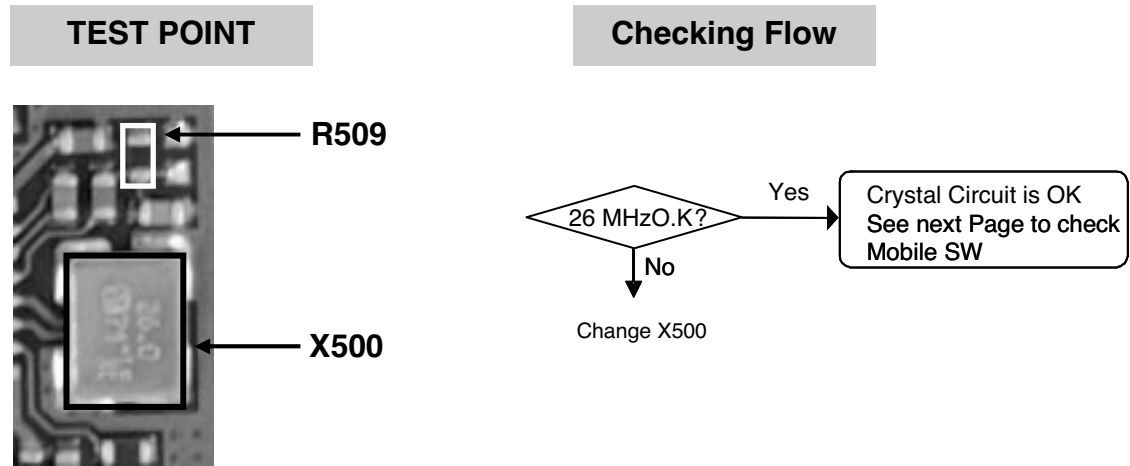
### 4.3 TX Trouble

#### Checking Flow



## 4. TROUBLE SHOOTING

### (1) Checking Crystal Circuit



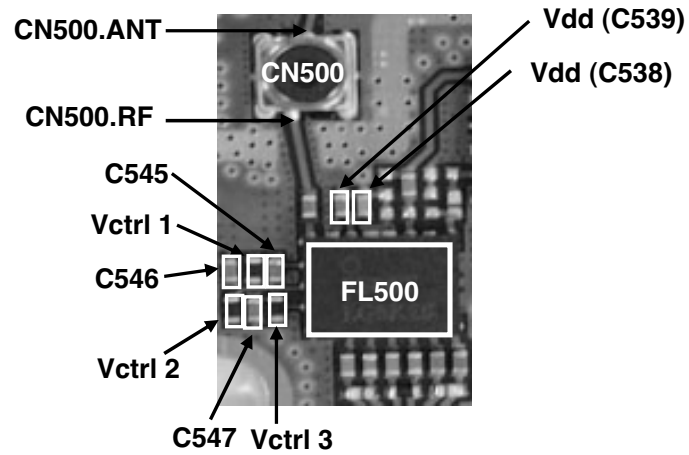
**Graph 4.3.1(a)**

**Graph 4.3.1(b)**

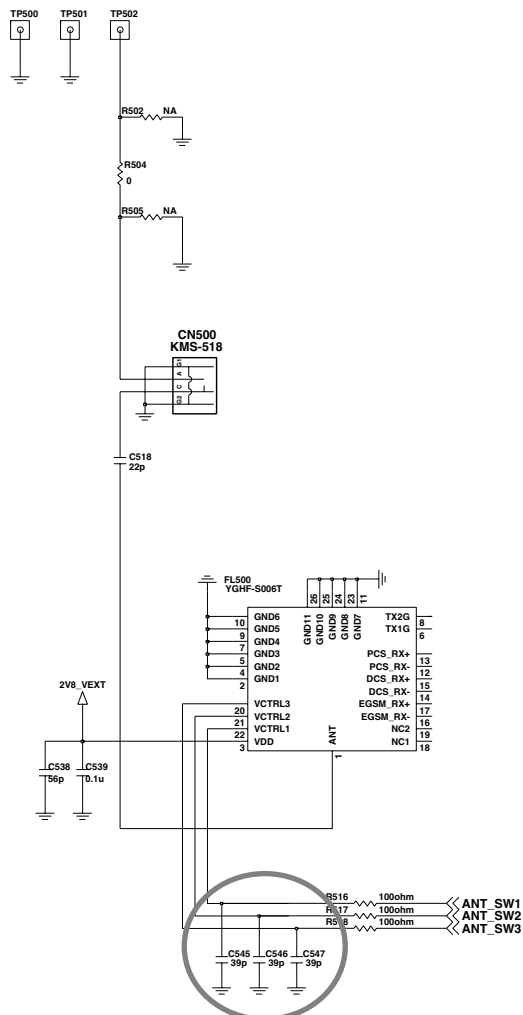
## 4. TROUBLE SHOOTING

### (2) Checking Mobile SW & FEM

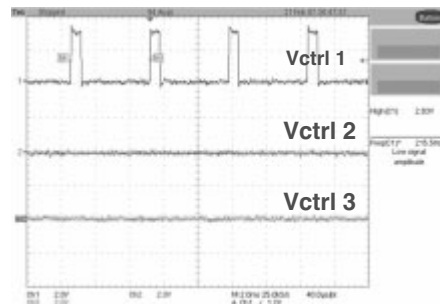
#### TEST POINT



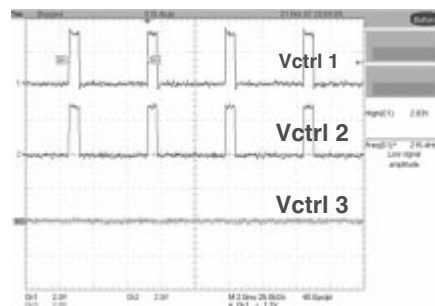
#### CIRCUIT



#### Waveform



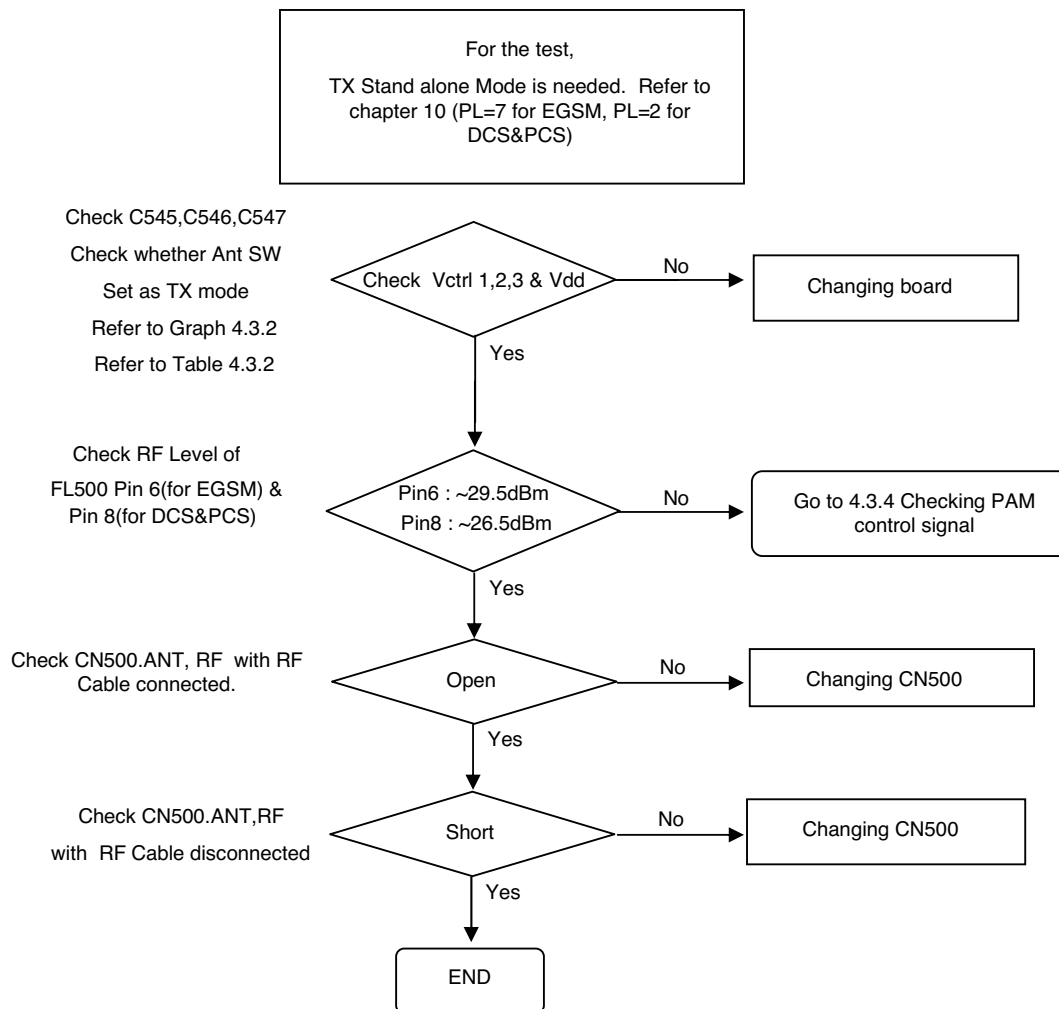
Graph 4.3.2(a) GSM Tx mode



Graph 4.3.2(b) DCS, PCS Tx mode

## 4. TROUBLE SHOOTING

### Checking Flow



TX Mode	EGSM	DCS/PCS
Vctrl 1	On	On
Vctrl 2	Off	On
Vctrl 3	Off	Off

**Table 4.3.2**

## 4. TROUBLE SHOOTING

### (3) Checking PAM Control Signal

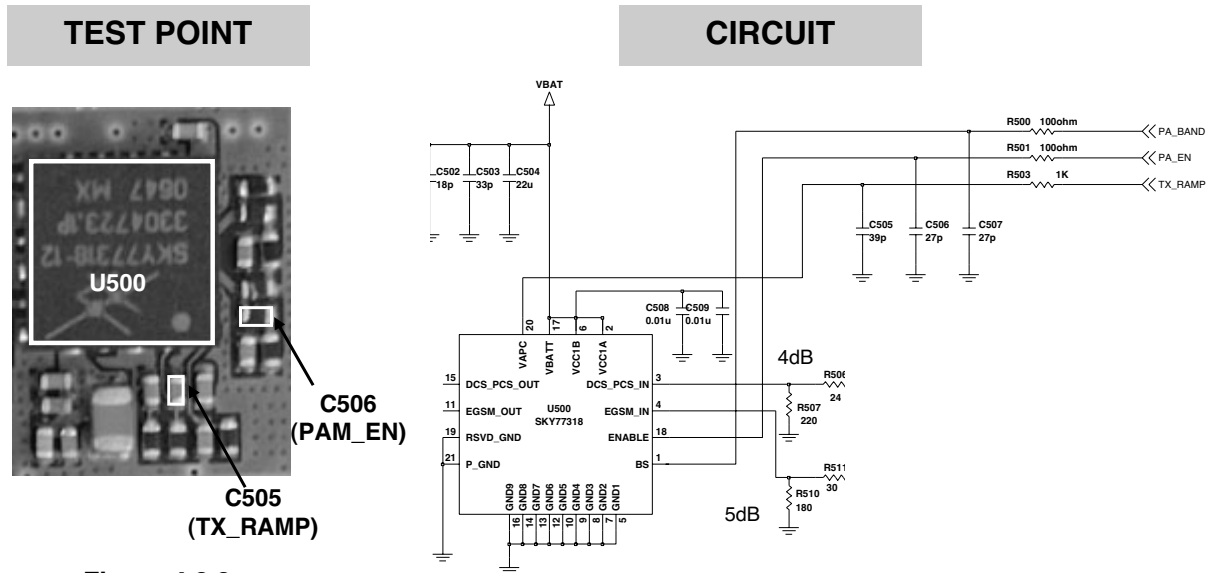
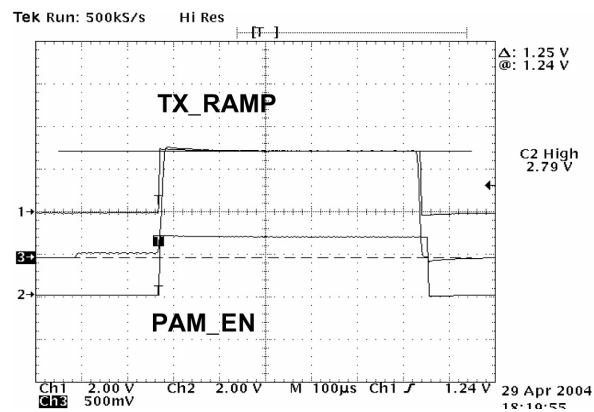


Figure 4.3.3

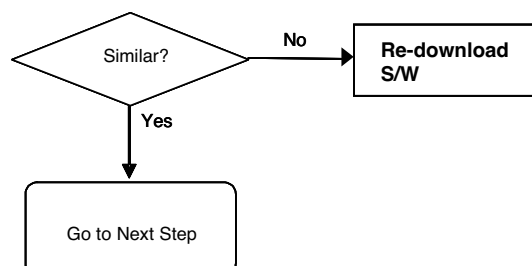
### Waveform



Graph 4.3.3

### Checking Flow

Check TX\_RAMP and PAM\_EN  
Check if there is  
Any Major Difference or not  
Refer to Graph 4.3.3





## 4. TROUBLE SHOOTING

### (4) Checking TX I/Q

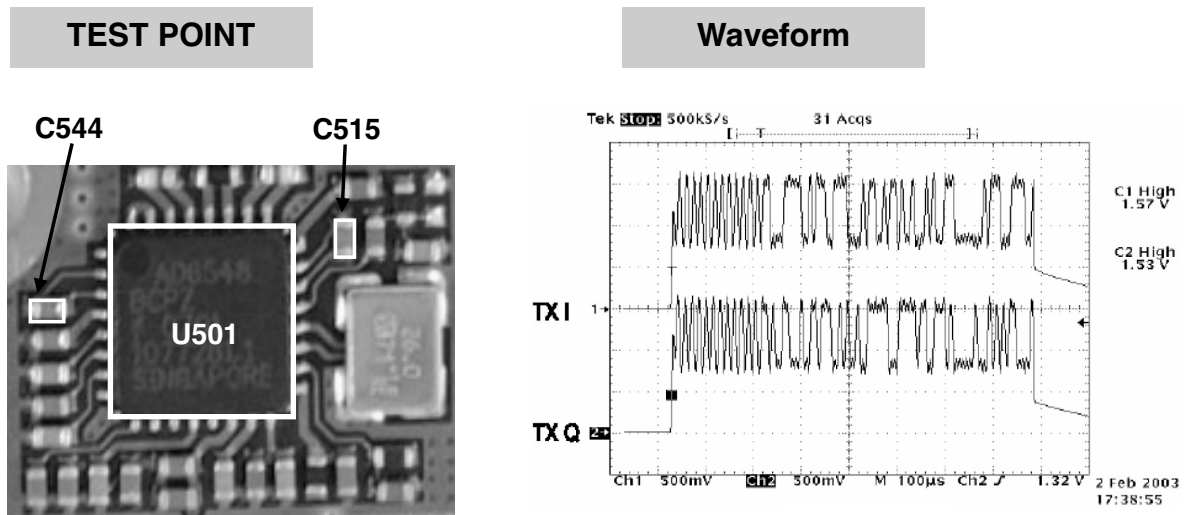
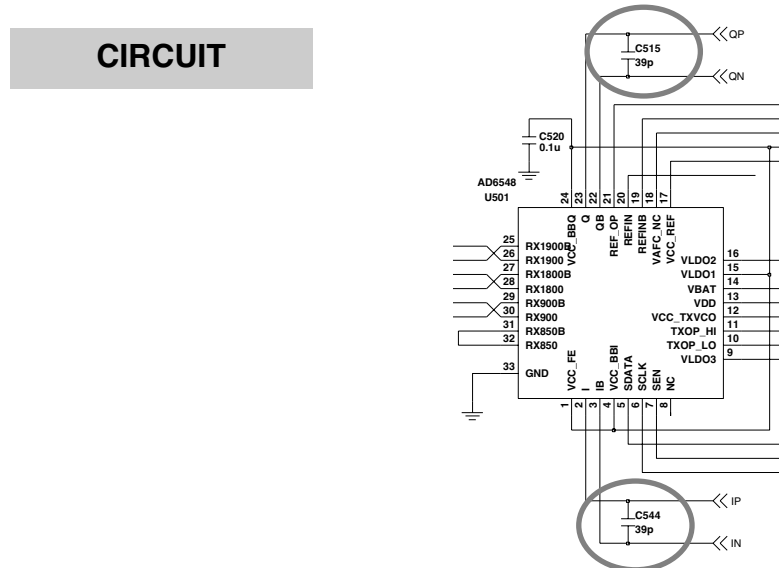
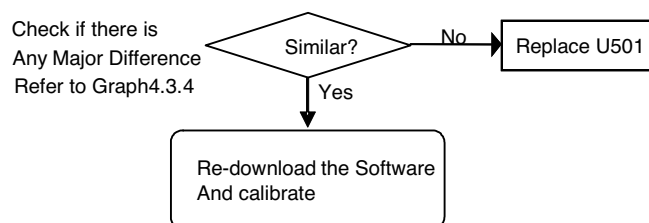


Figure 4.3.4

Graph 4.3.4



### Checking Flow



### 4.4 Power On Trouble

#### TEST POINT

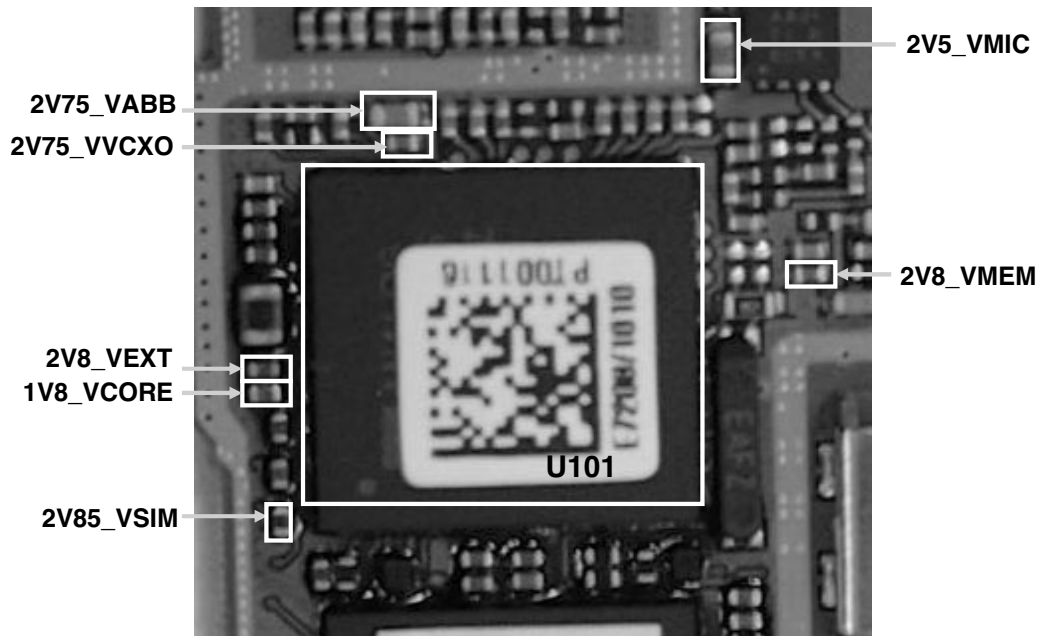
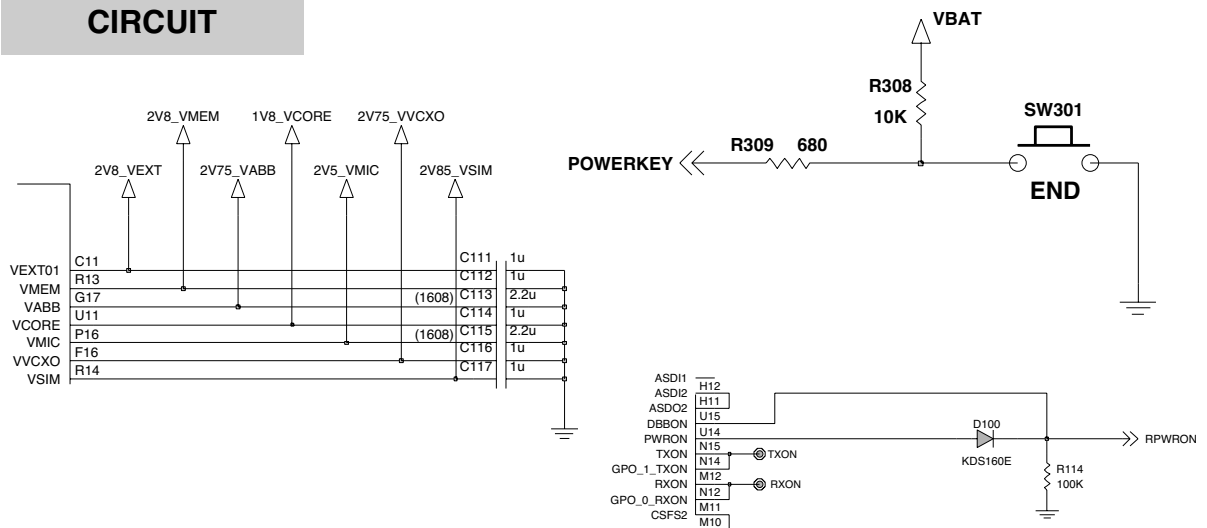


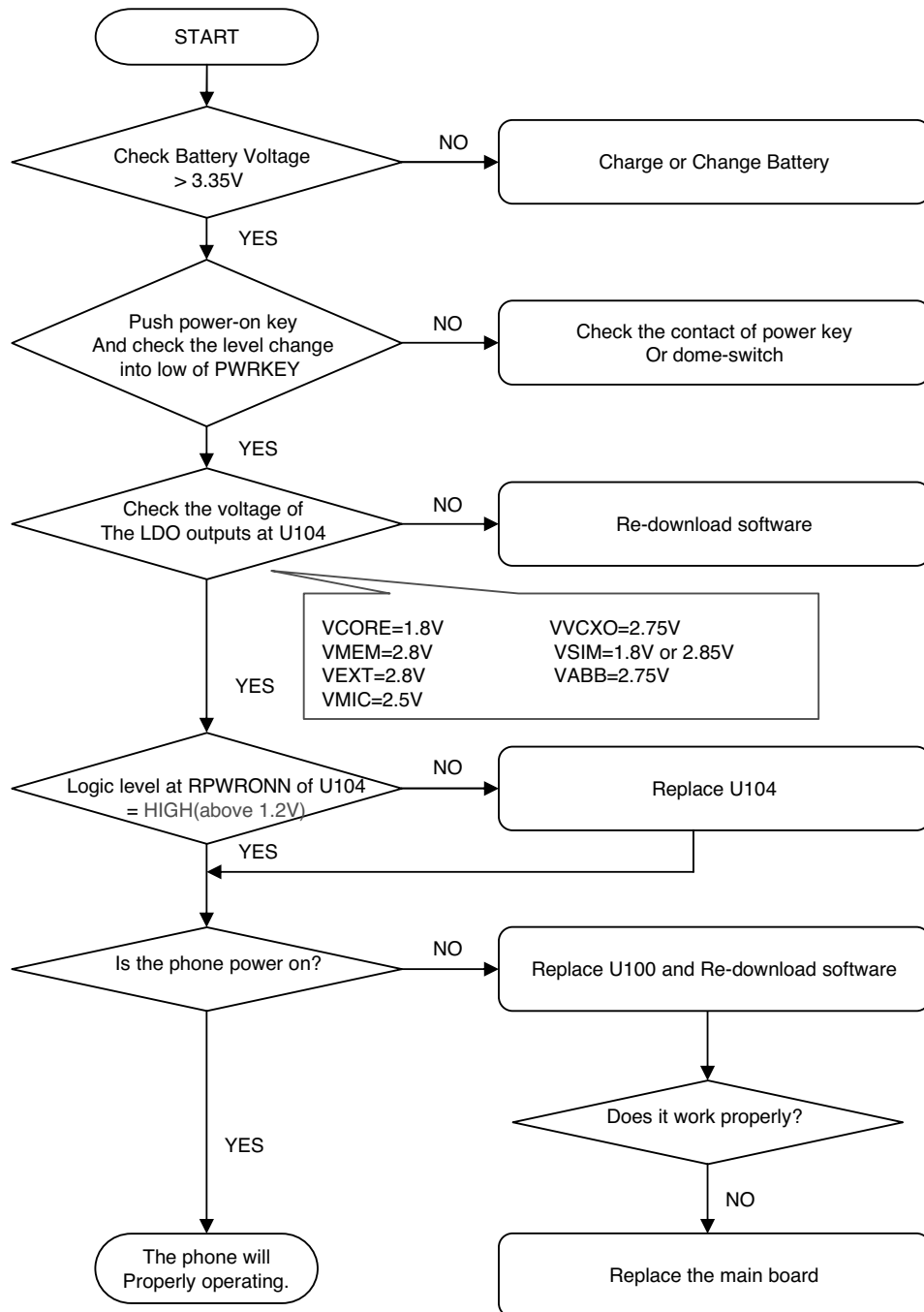
Figure 4.4

#### CIRCUIT



## 4. TROUBLE SHOOTING

### Checking Flow



## 4. TROUBLE SHOOTING

### 4.5 Charging Trouble

#### TEST POINT

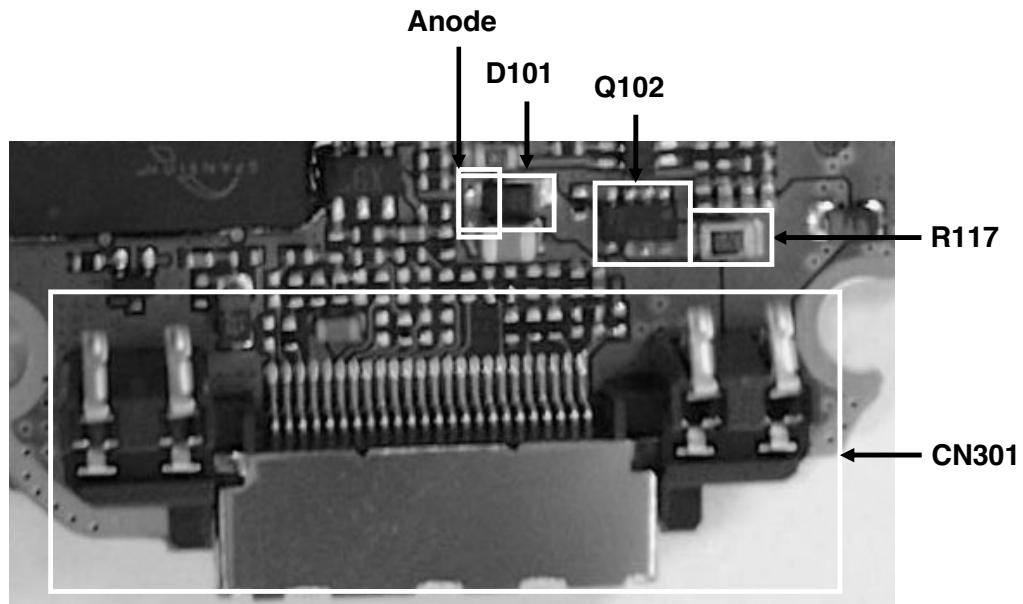
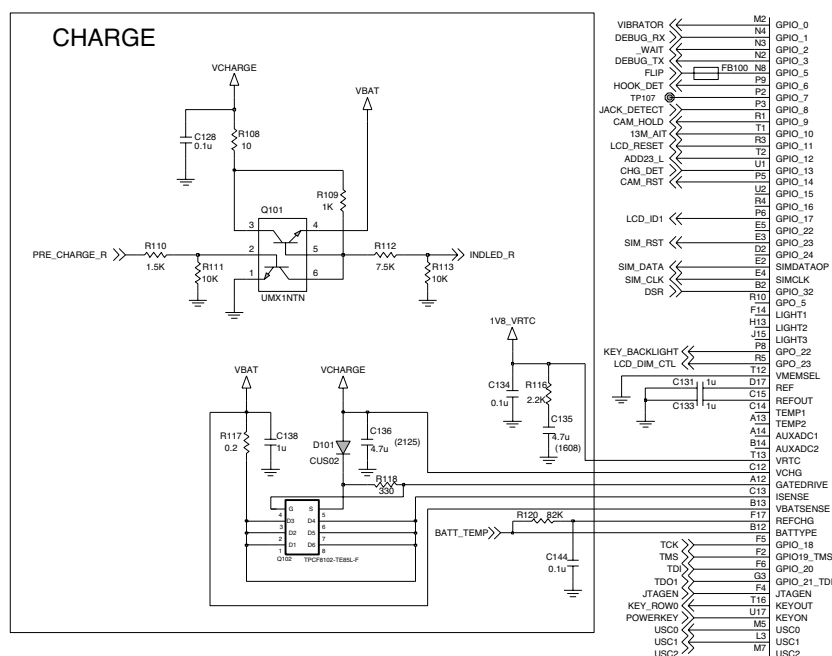


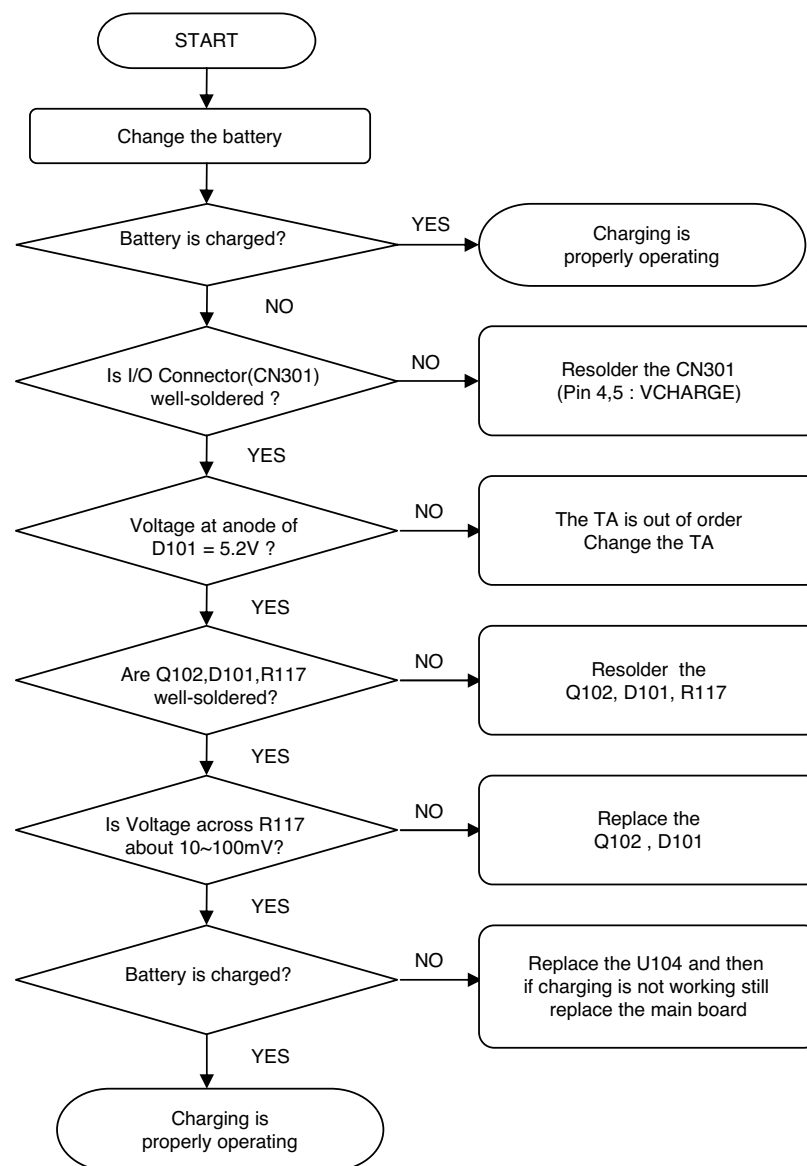
Figure 4.5

#### CIRCUIT



## 4. TROUBLE SHOOTING

### Checking Flow



### 4.6 Vibrator Trouble

#### TEST POINT

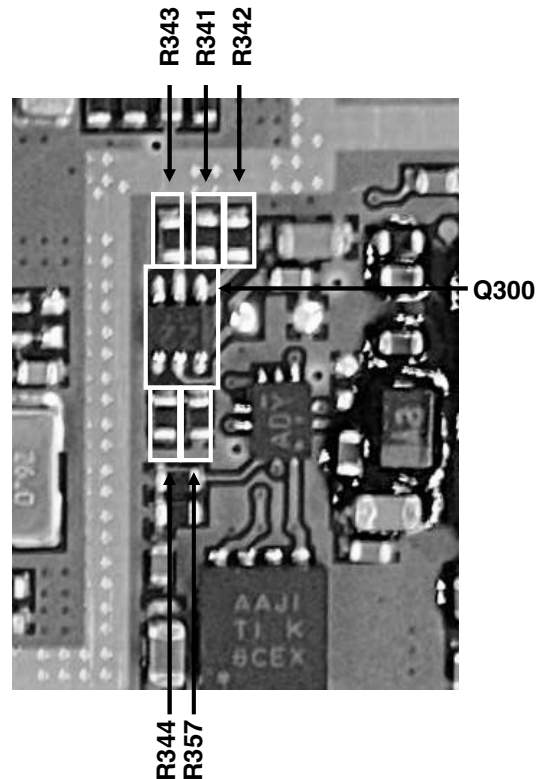
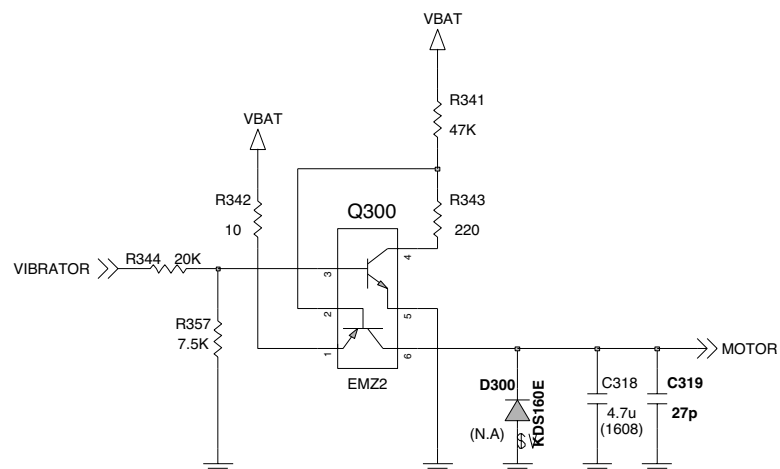


Figure 4.6

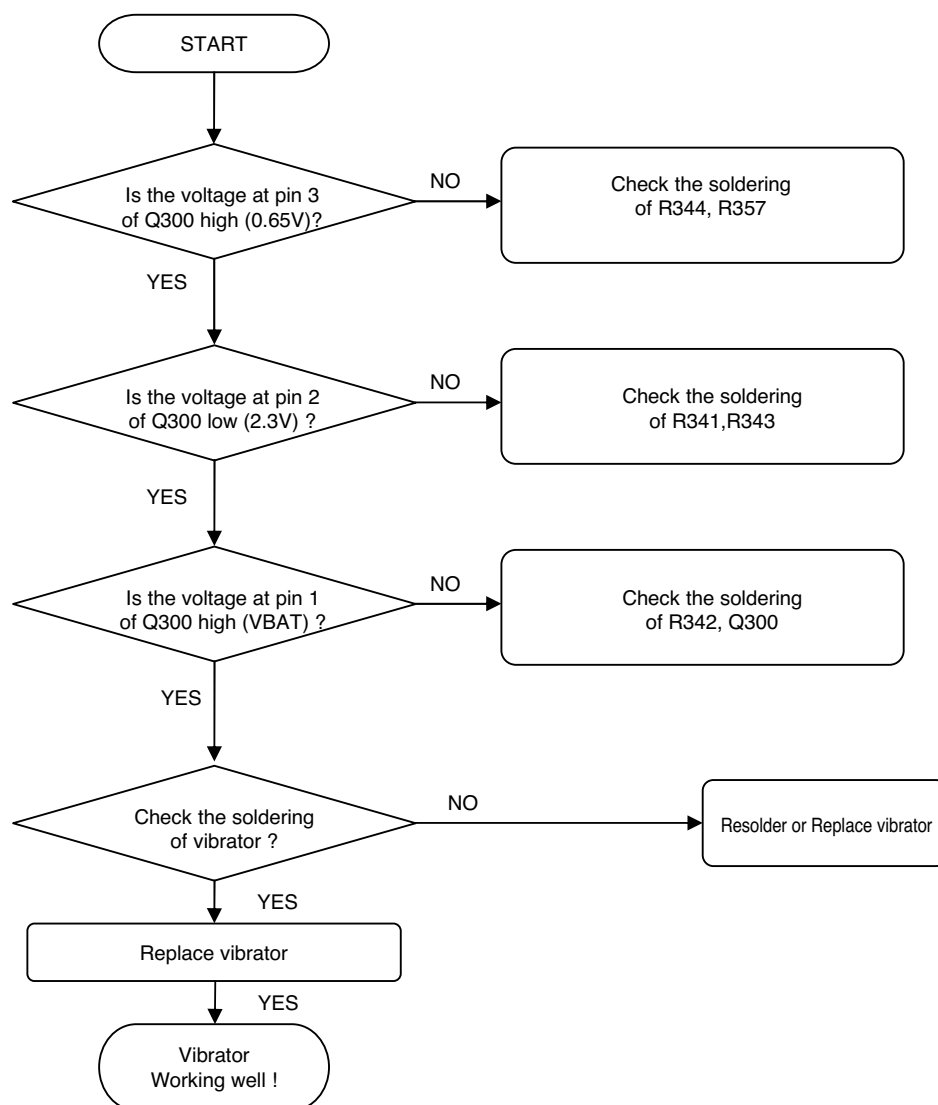
#### CIRCUIT



## 4. TROUBLE SHOOTING

### Checking Flow

SETTING : Enter the engineering mode, and set vibrator on at vibration of BB test menu



### 4.7 LCD Trouble

#### TEST POINT

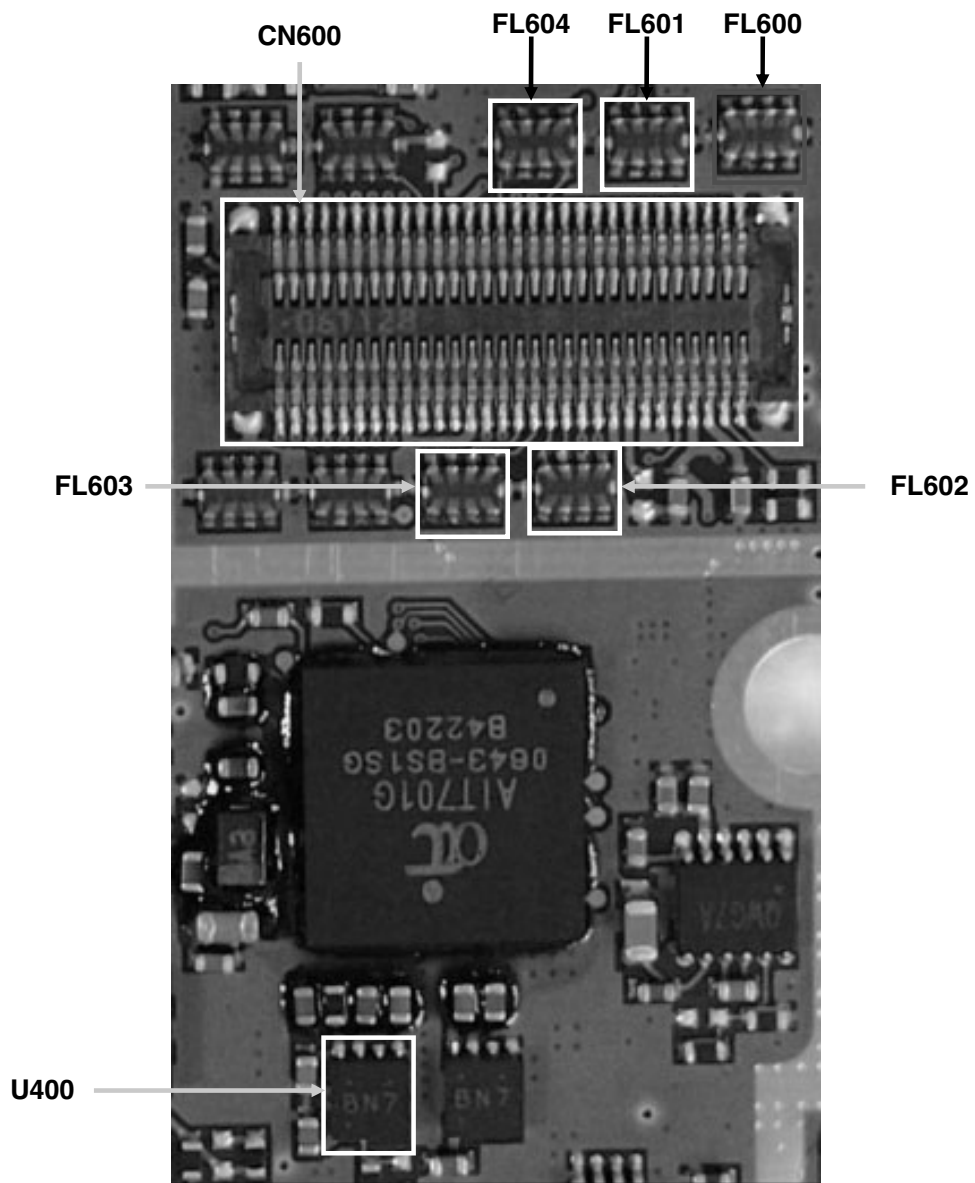
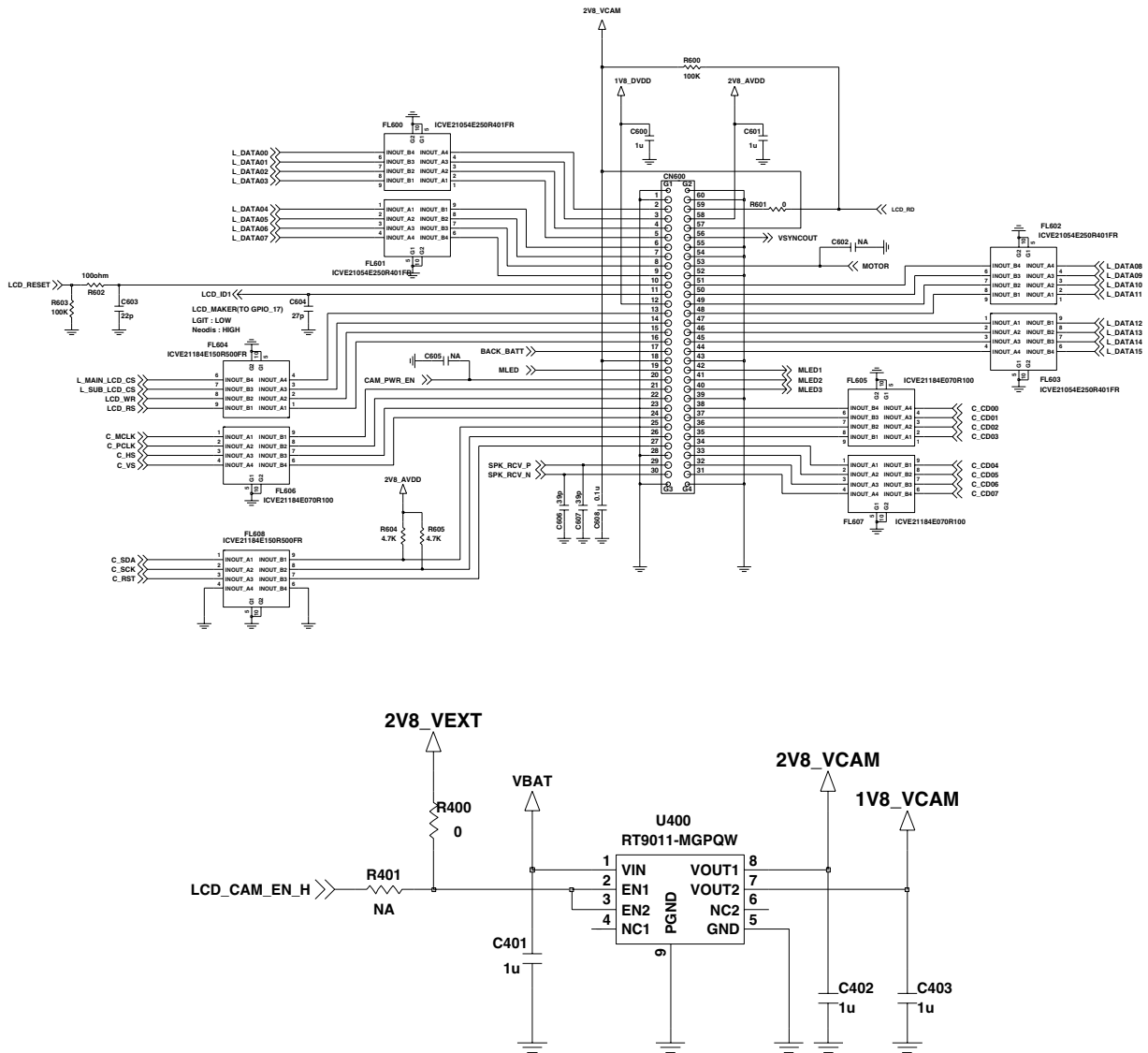


Figure 4.7

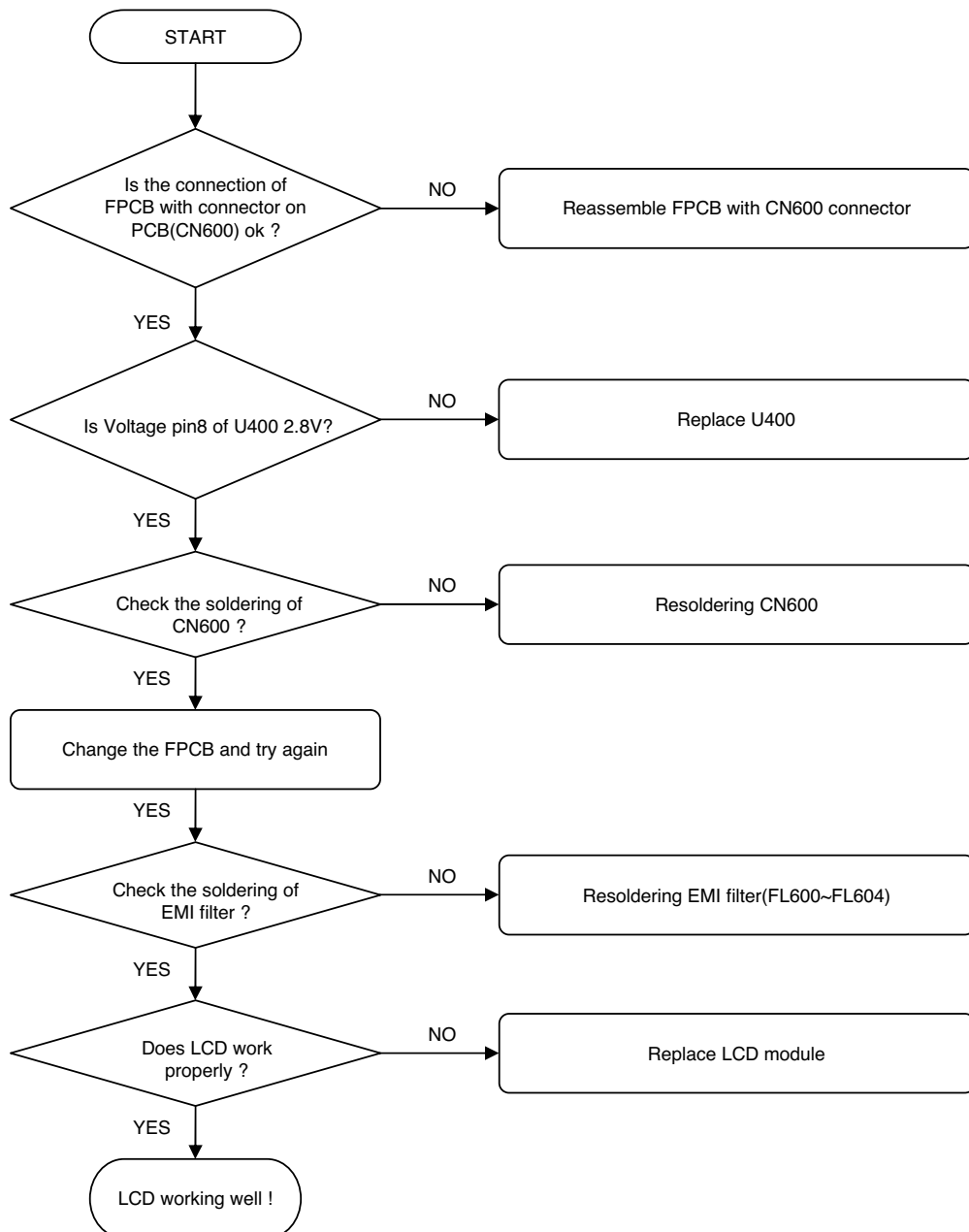


## 4. TROUBLE SHOOTING

### CIRCUIT



### Checking Flow



## 4. TROUBLE SHOOTING

---

### 4.8 Camera Trouble

#### TEST POINT

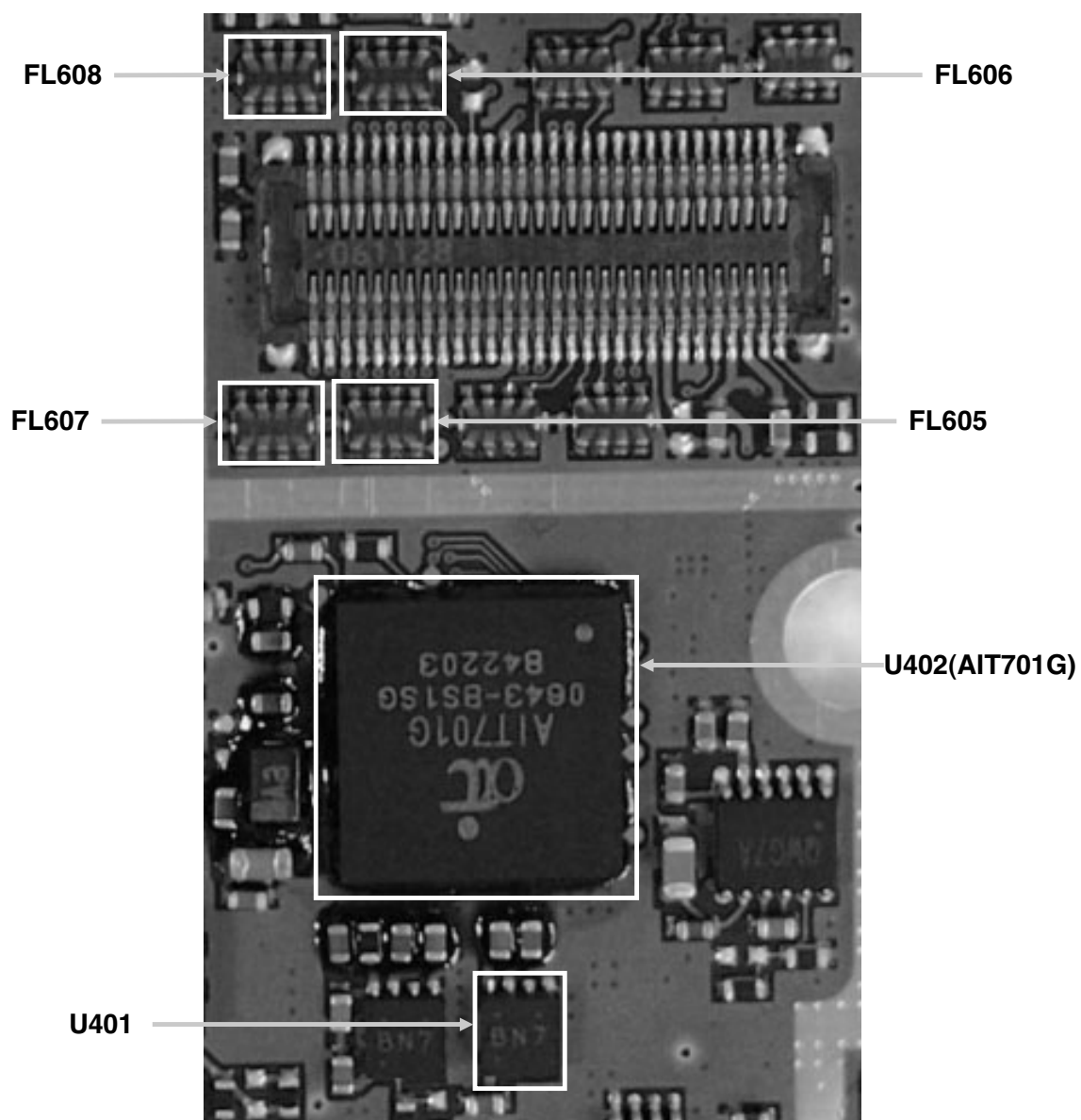
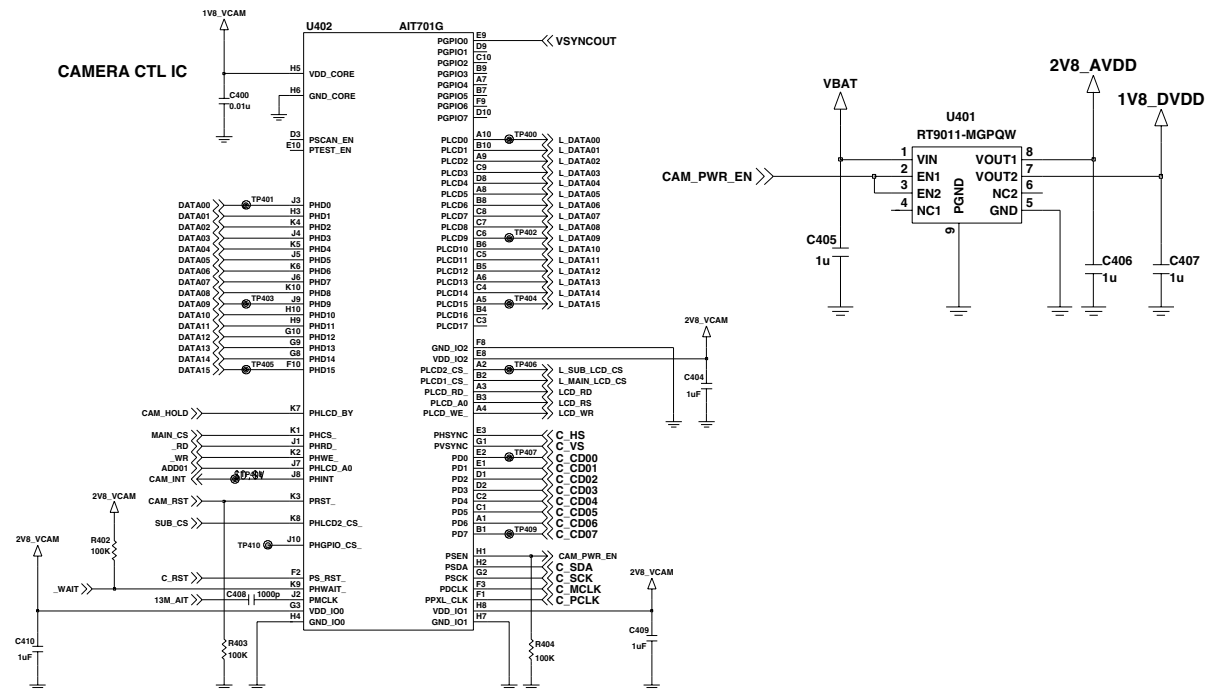
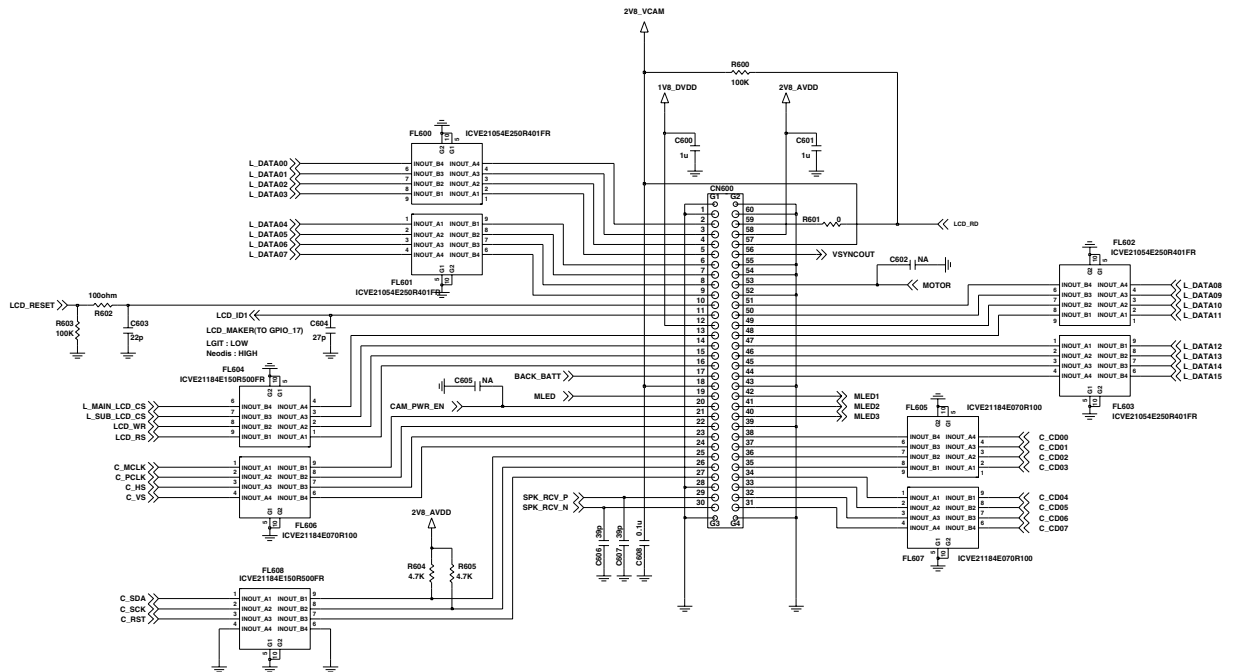


Figure 4.8

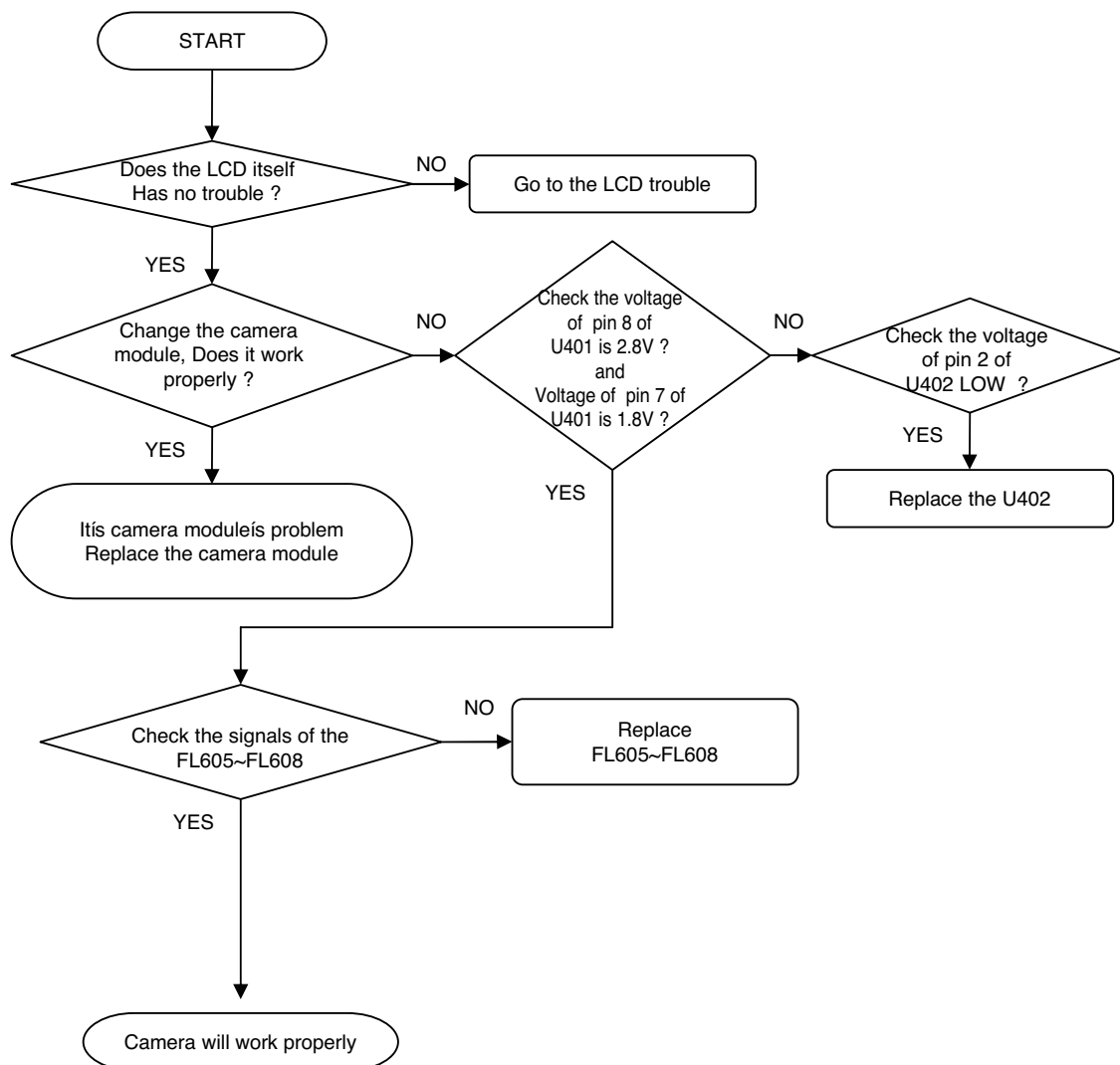
## CIRCUIT



## 4. TROUBLE SHOOTING

---

### Checking Flow



### 4.9 Speaker Trouble

#### TEST POINT

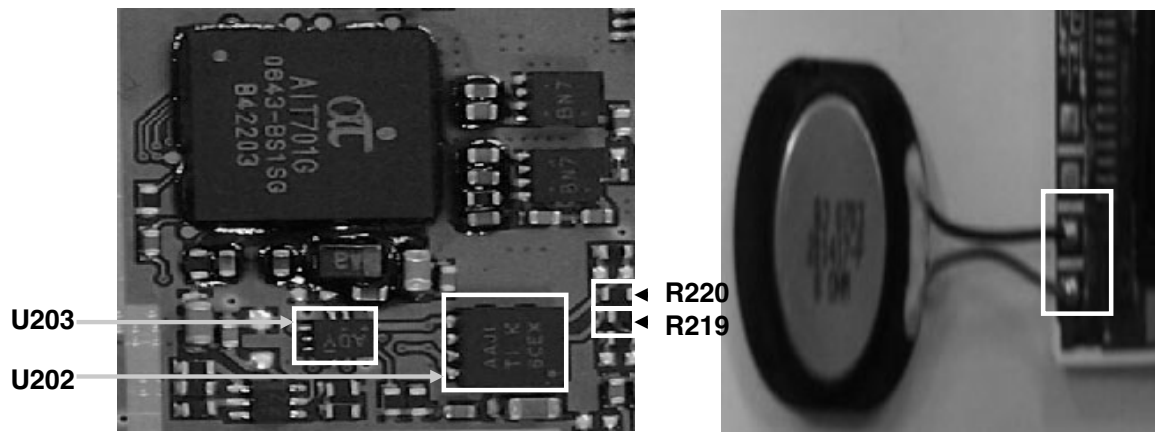
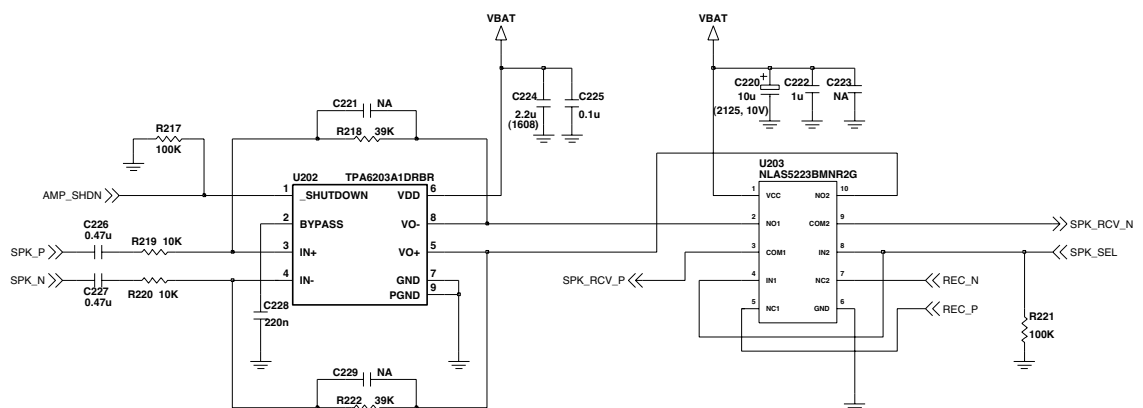


Figure 4.9

#### CIRCUIT

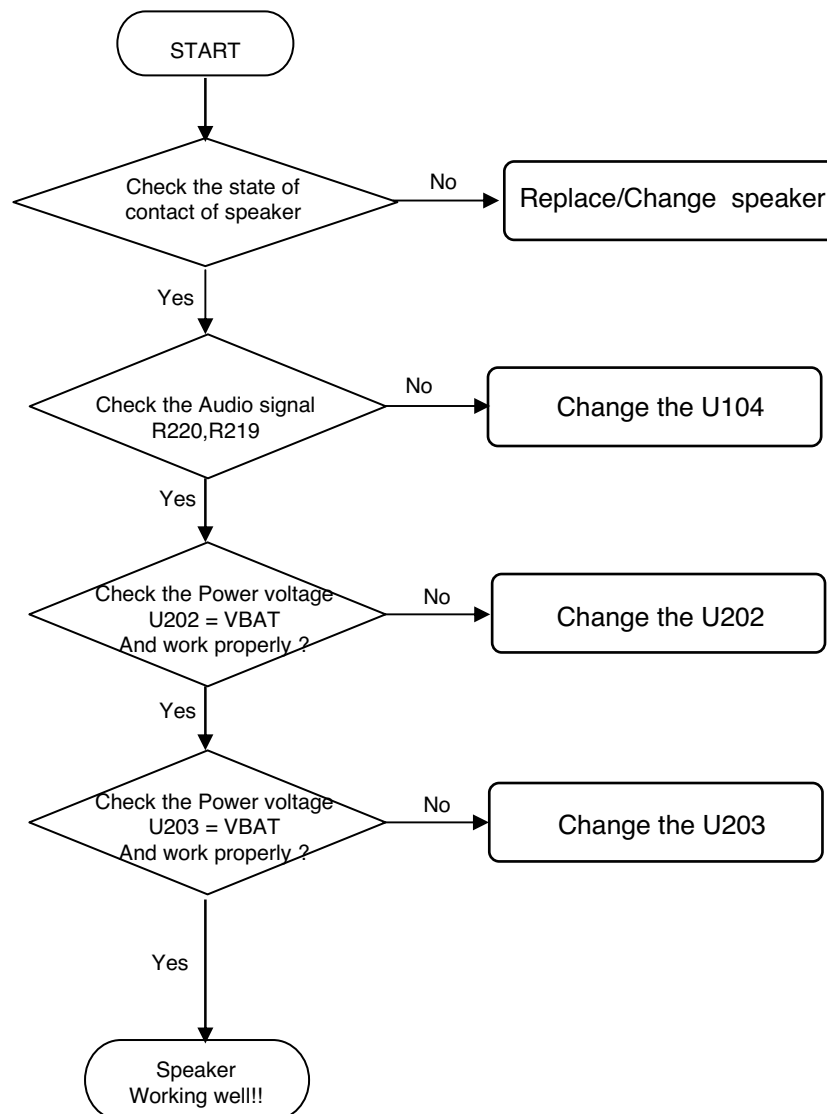
#### ACOUSTIC & MIDI



## 4. TROUBLE SHOOTING

---

### Checking Flow



### 4.10 SIM Card Interface Trouble

#### TEST POINT

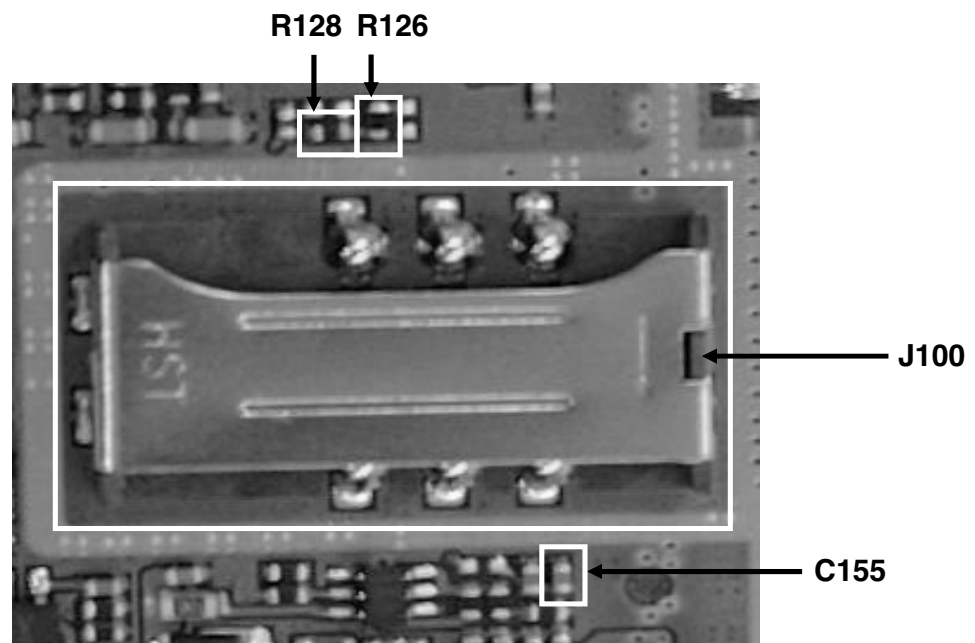
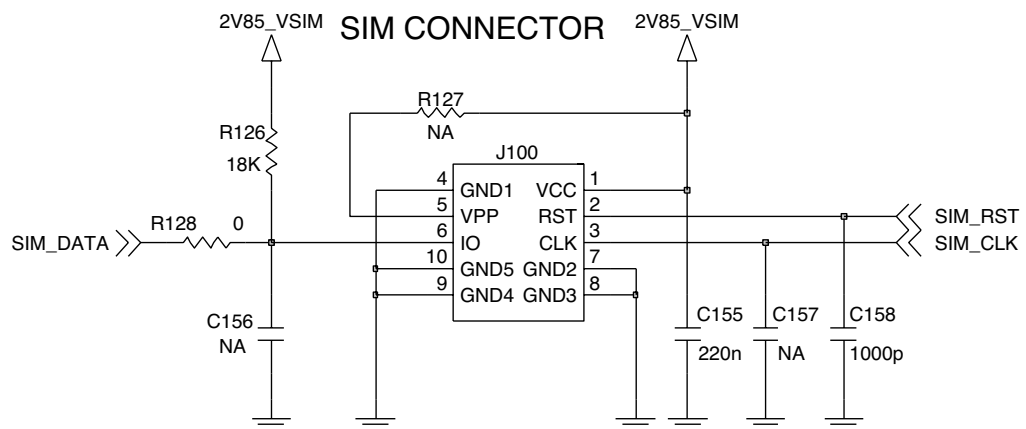


Figure 4.10

#### CIRCUIT

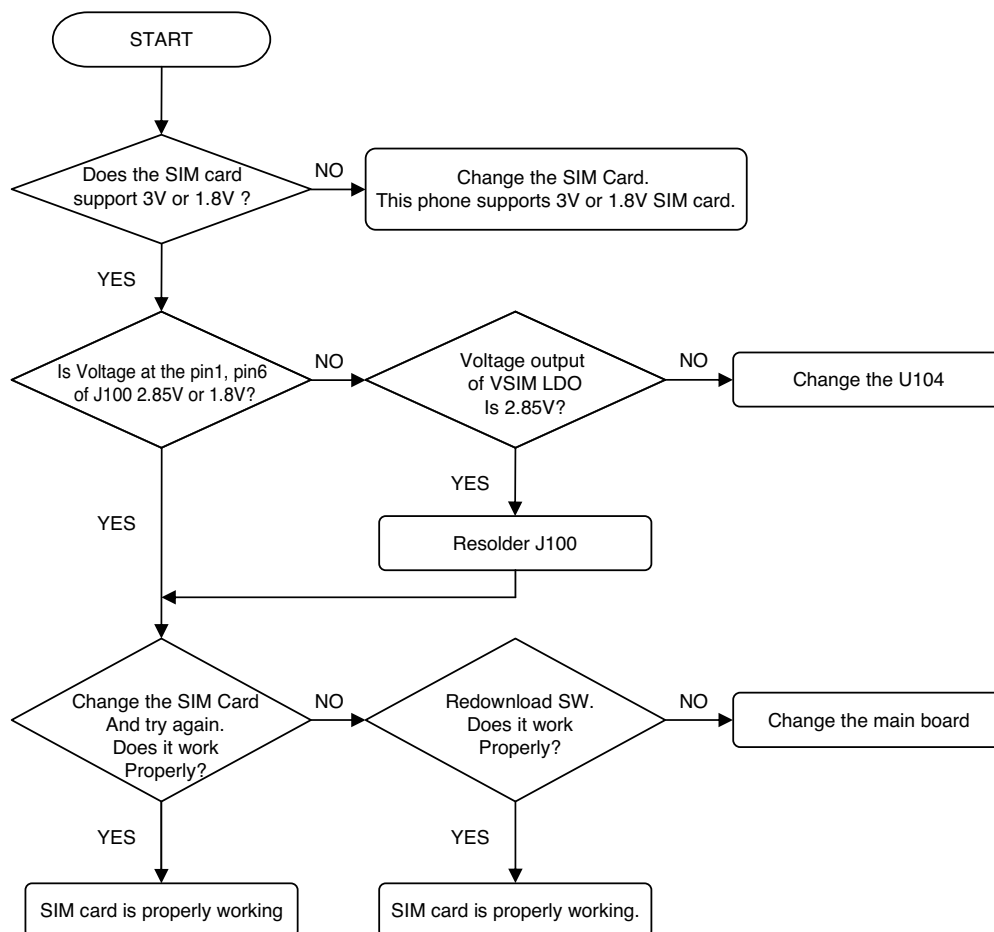




## 4. TROUBLE SHOOTING

---

### Checking Flow



### 4.11 Earphone Trouble

#### TEST POINT

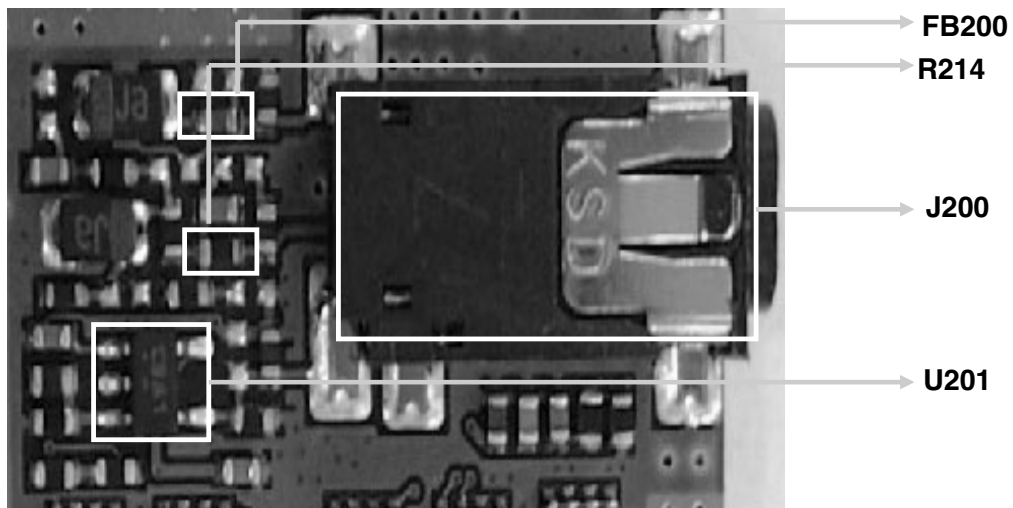
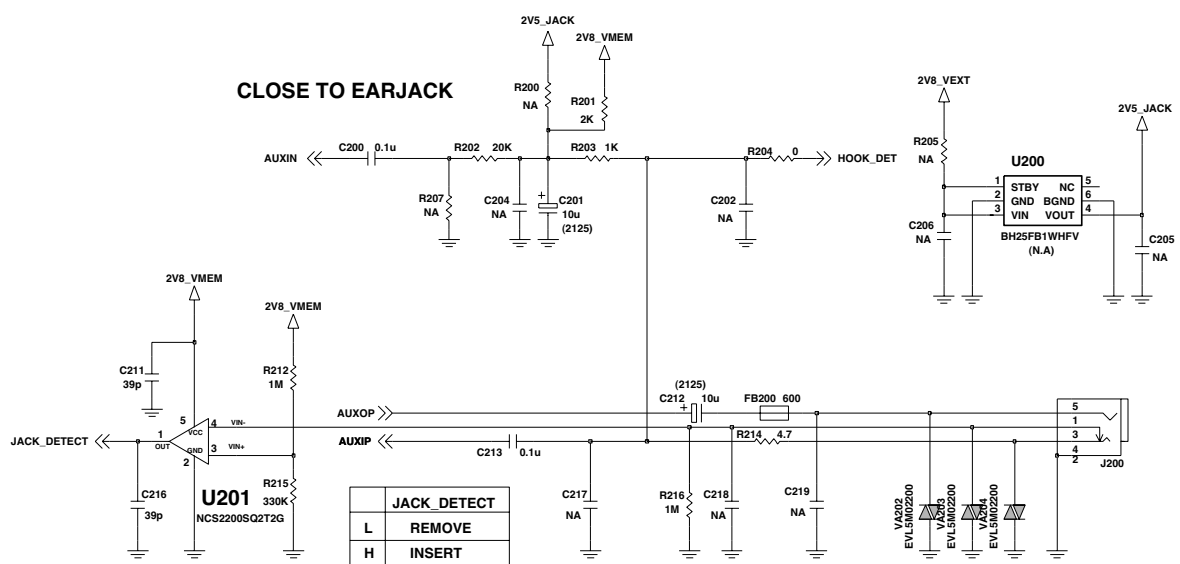


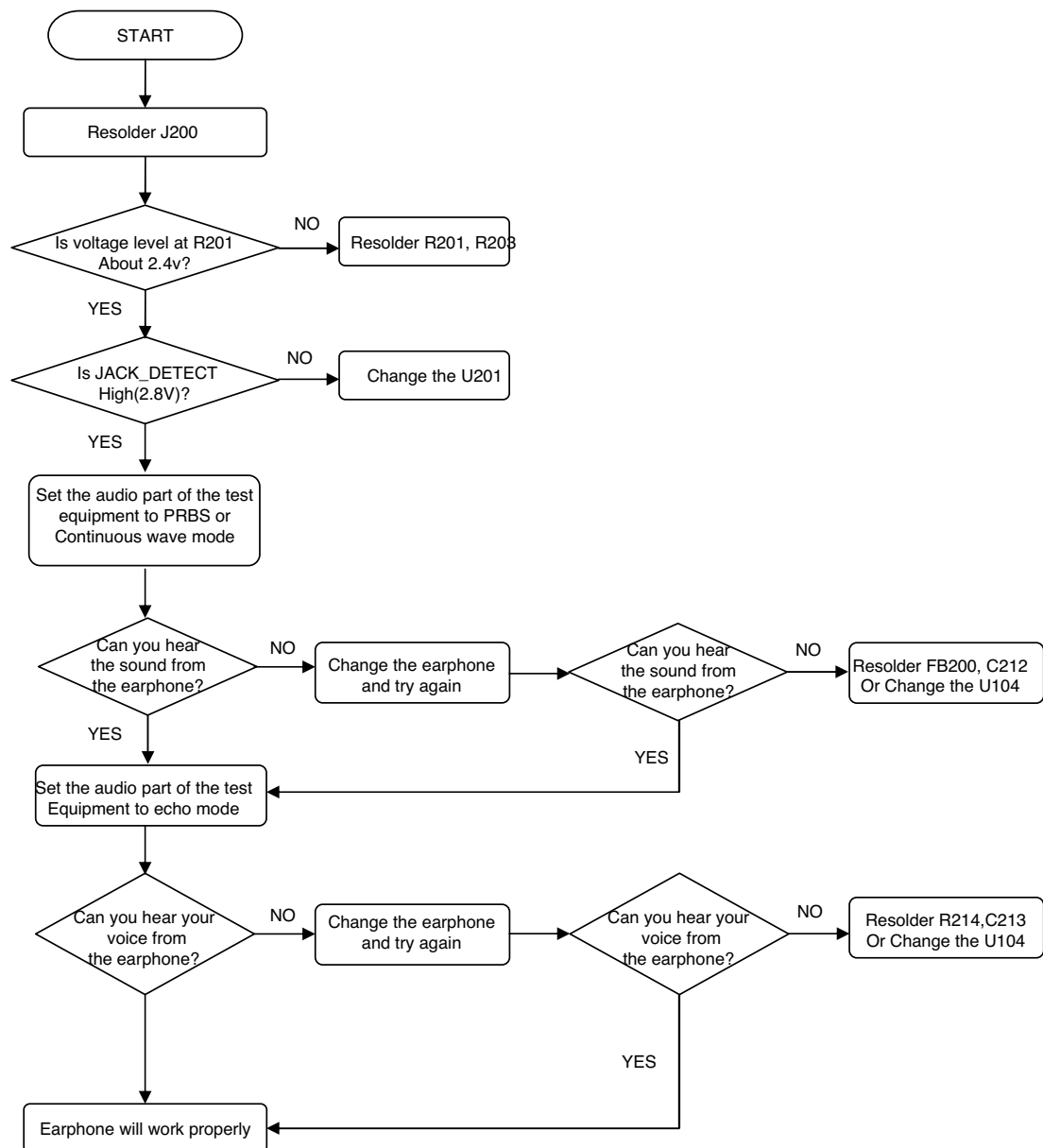
Figure 4.11

#### CIRCUIT



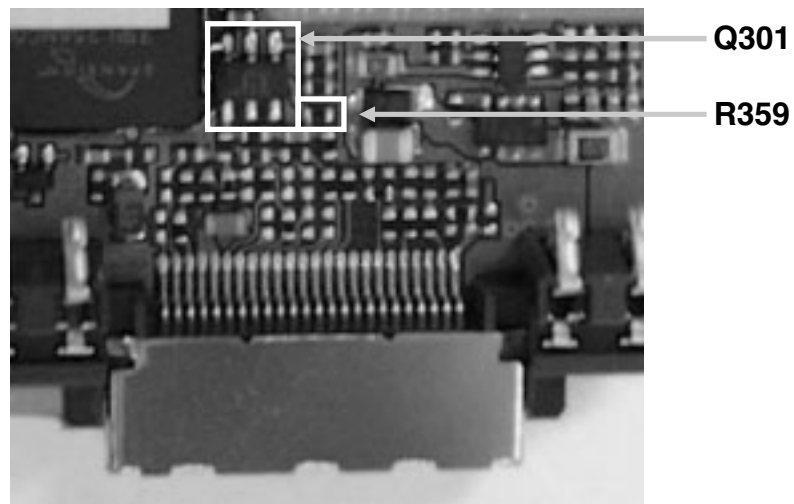
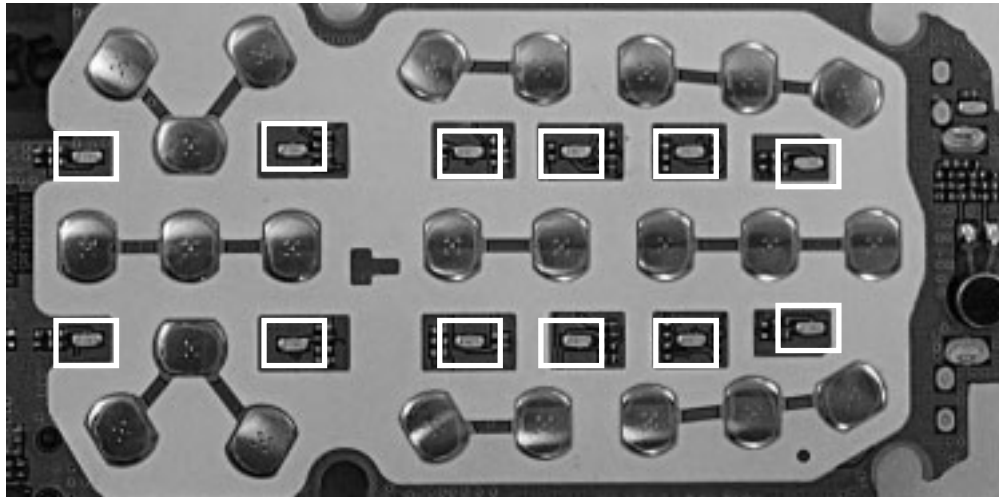
## 4. TROUBLE SHOOTING

### Checking Flow



### 4.12 KEY backlight Trouble

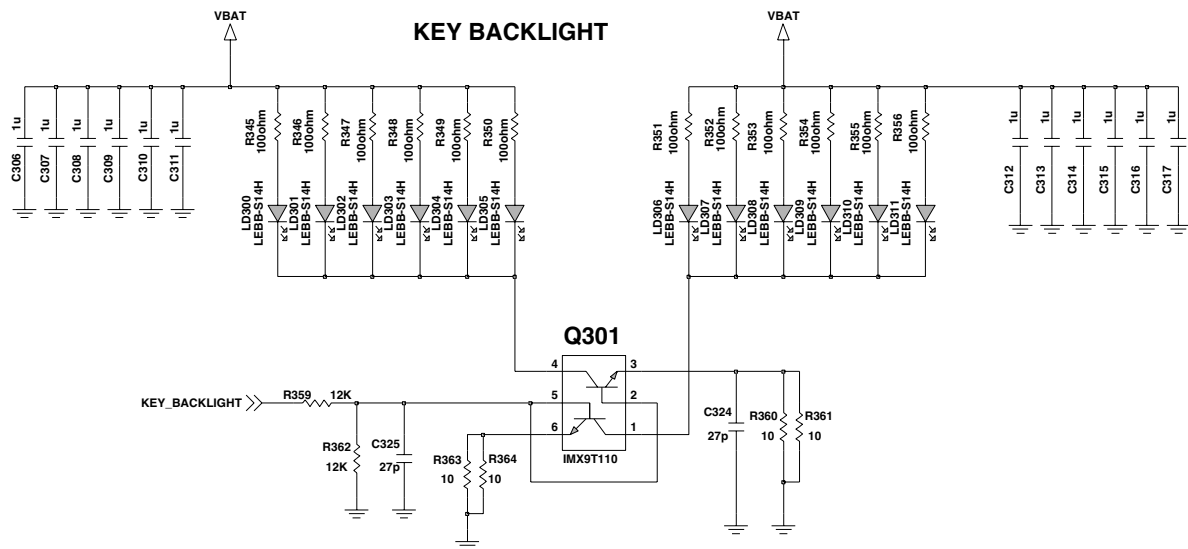
#### TEST POINT



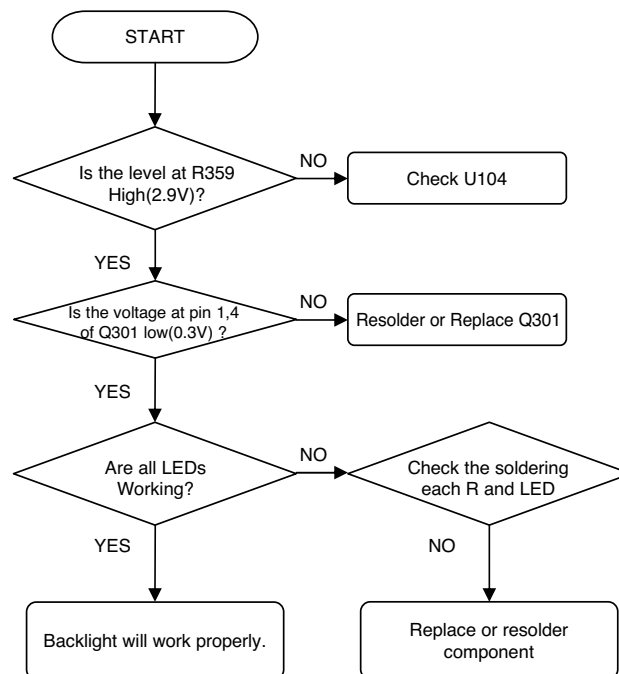
**Figure 4.12**

## 4. TROUBLE SHOOTING

### CIRCUIT



### CHECKING FLOW



### 4.13 Receiver Trouble

#### TEST POINT

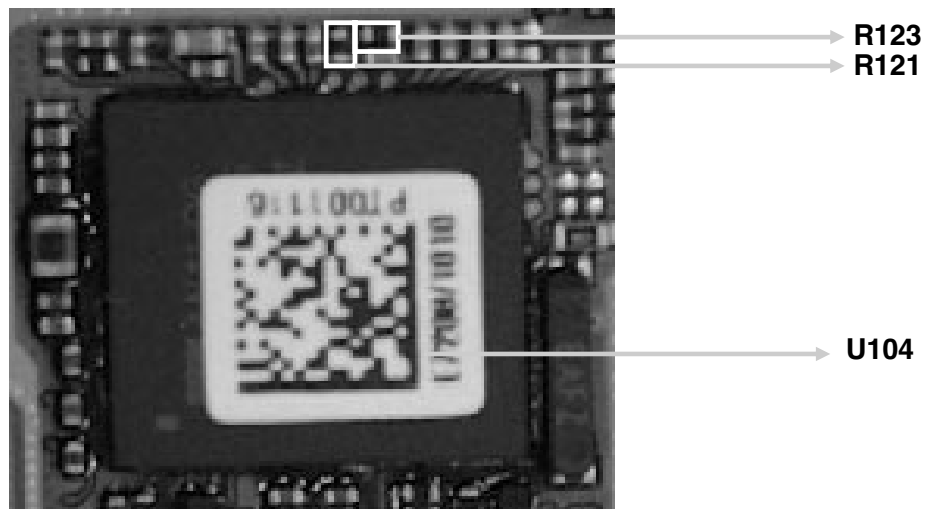
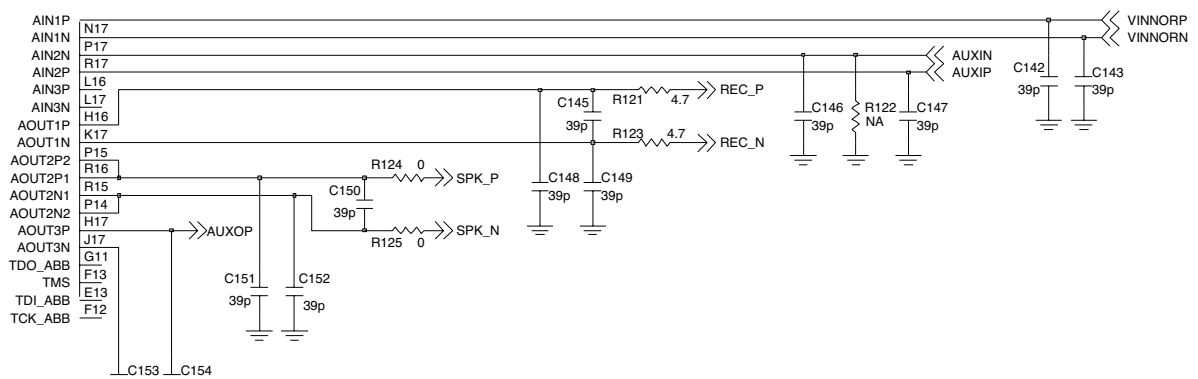


Figure 4.13

#### CIRCUIT



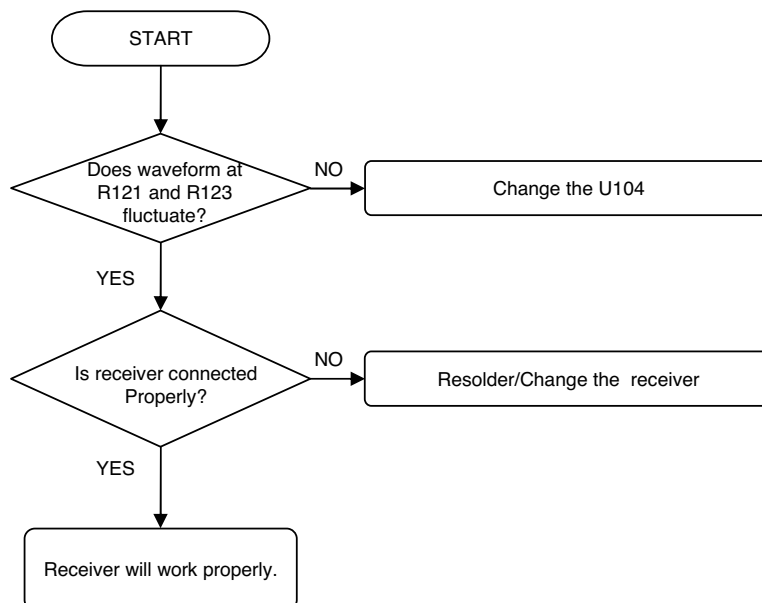
## 4. TROUBLE SHOOTING

---

### Checking Flow

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode

Set the property of audio as PRBS or continuous wave. Set the receiving volume of mobile as Max.



### 4.14 Microphone Trouble

#### TEST POINT

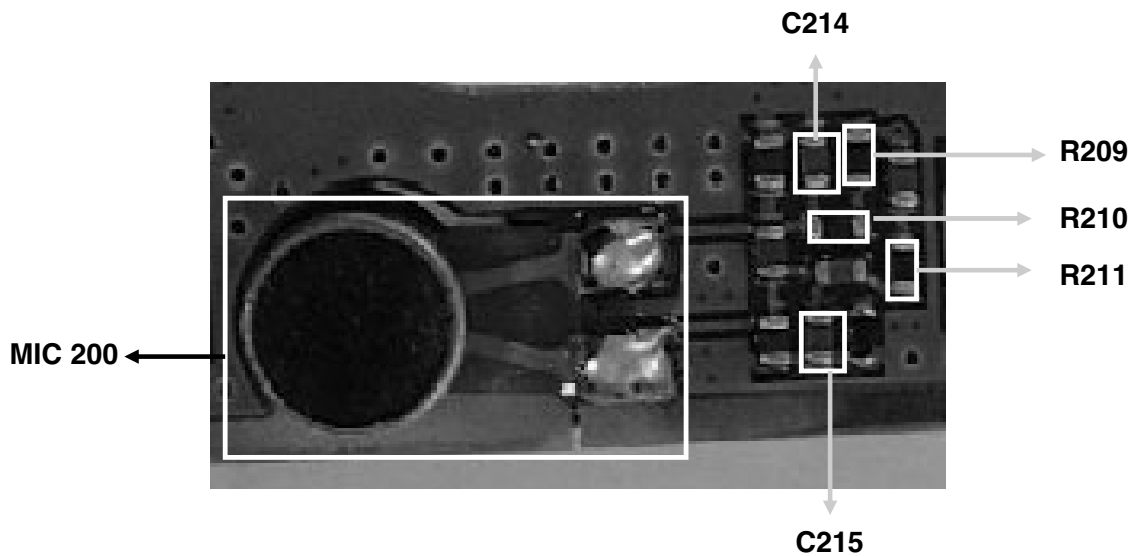
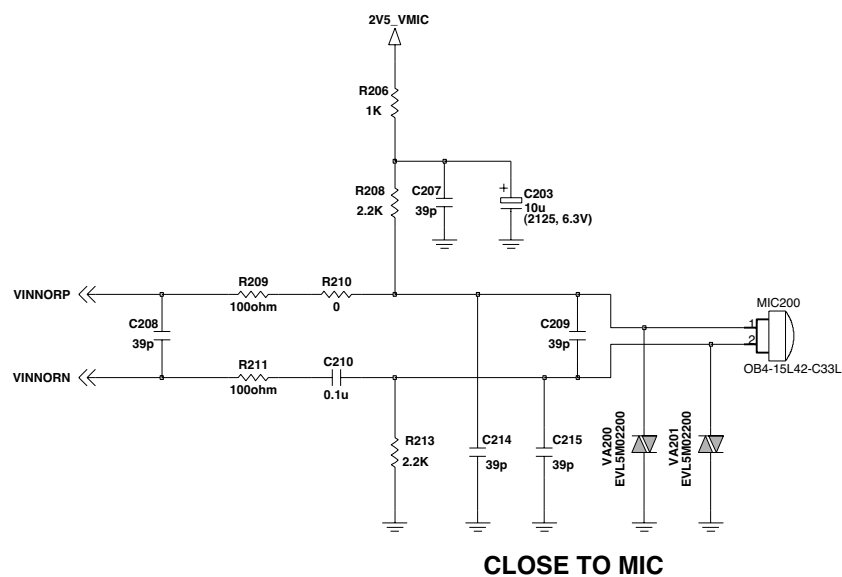


Figure 4.14

#### CIRCUIT



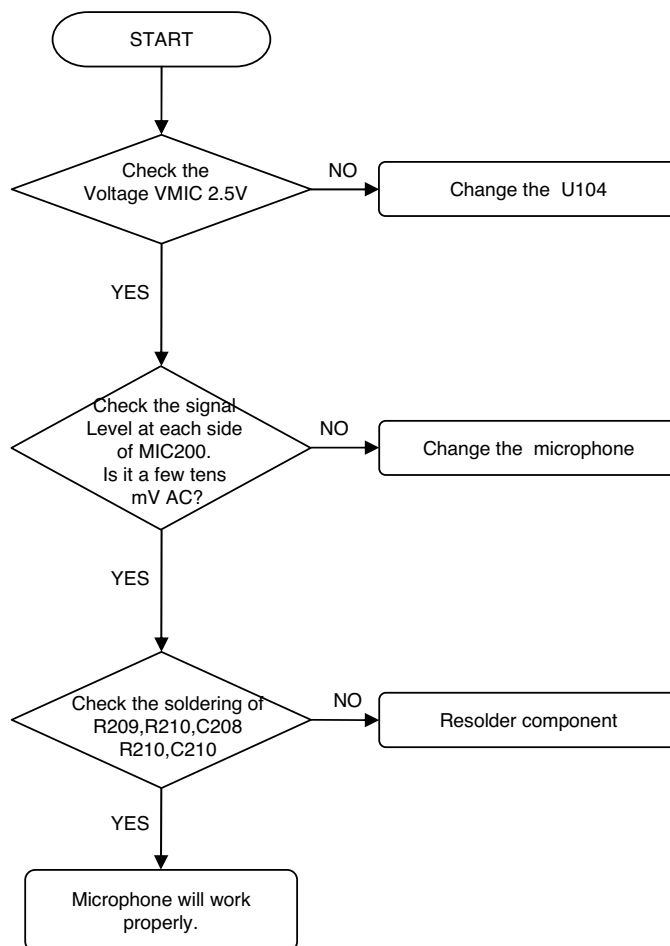


## 4. TROUBLE SHOOTING

---

### Checking Flow

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode



4.15 RTC Trouble

TEST POINT

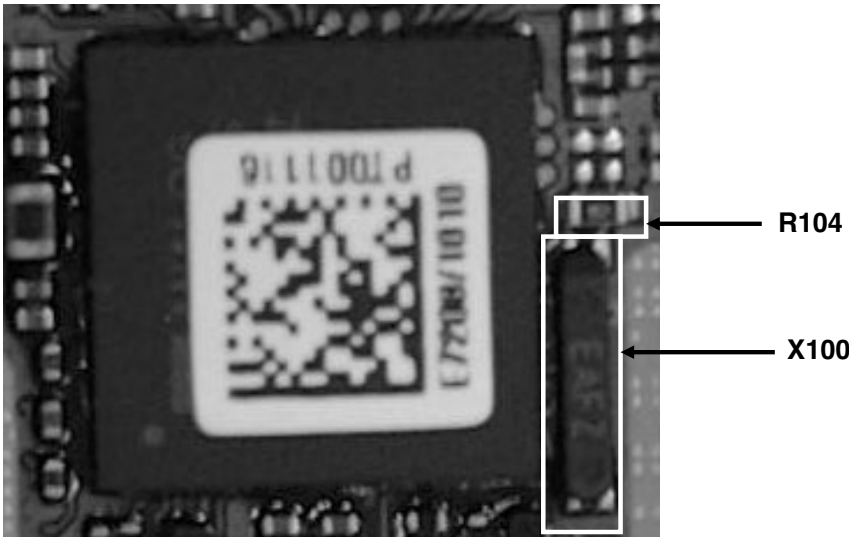
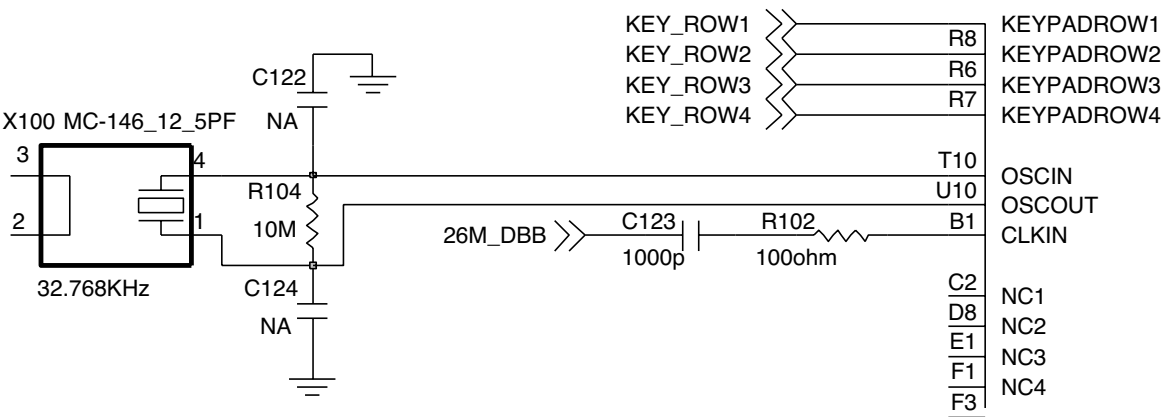


Figure 4.15

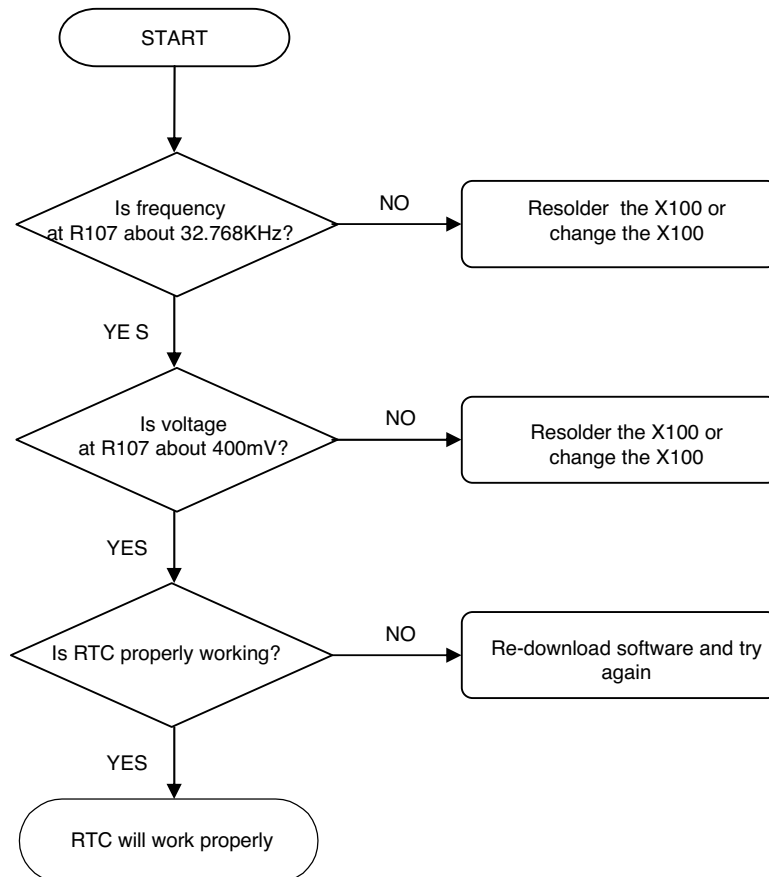
CIRCUIT



## 4. TROUBLE SHOOTING

---

### Checking Flow



### 4.16 Indicator LED Trouble

#### TEST POINT

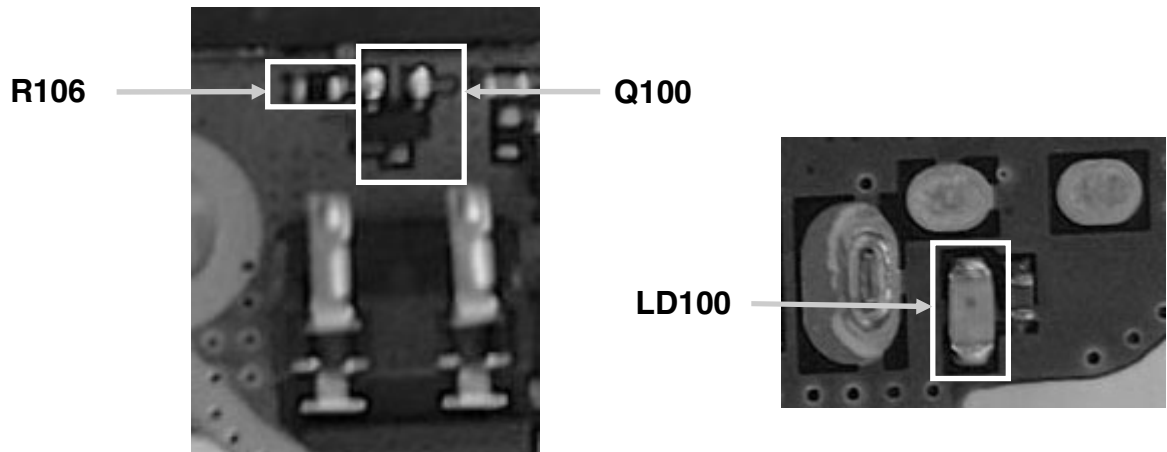
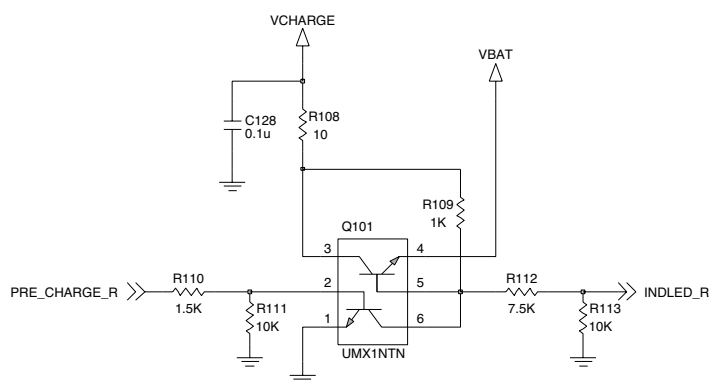


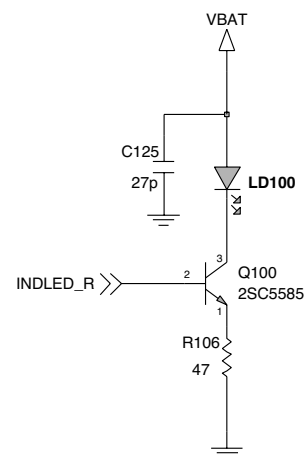
Figure 4.16

#### CIRCUIT

#### CHARGE



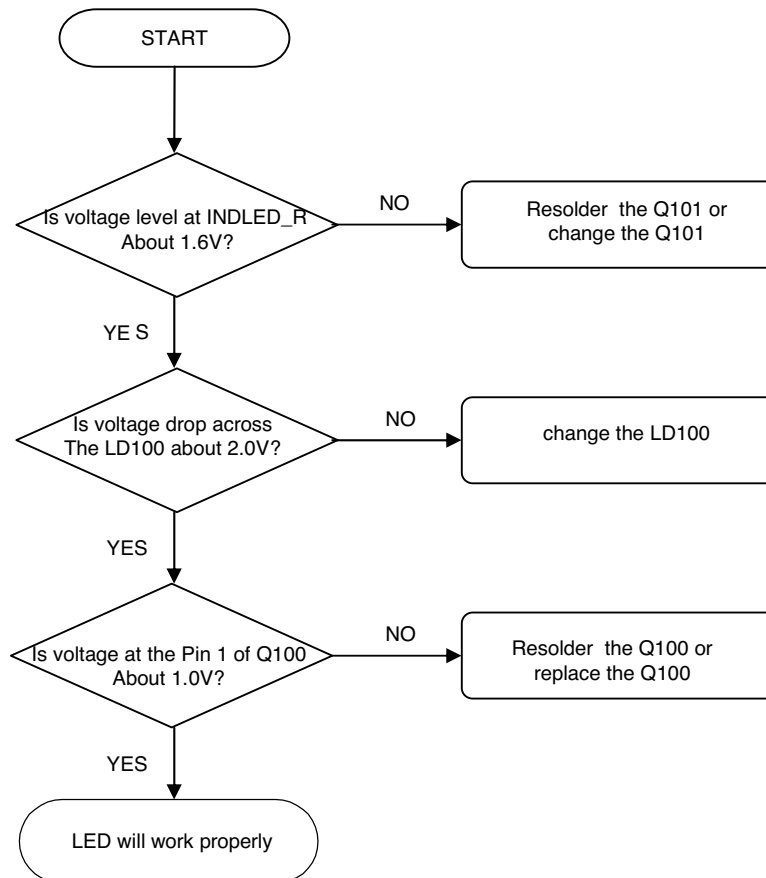
#### INDICATOR LED



## 4. TROUBLE SHOOTING

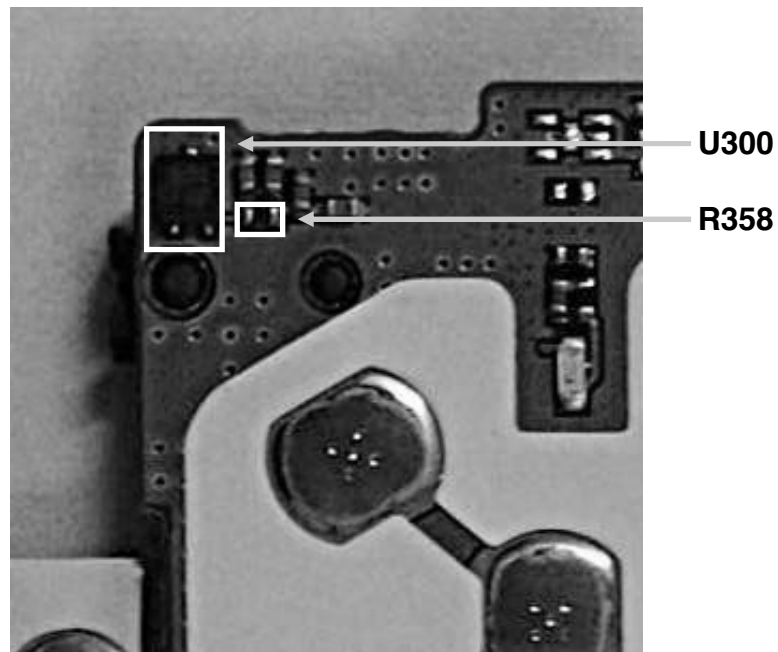
---

### Checking Flow



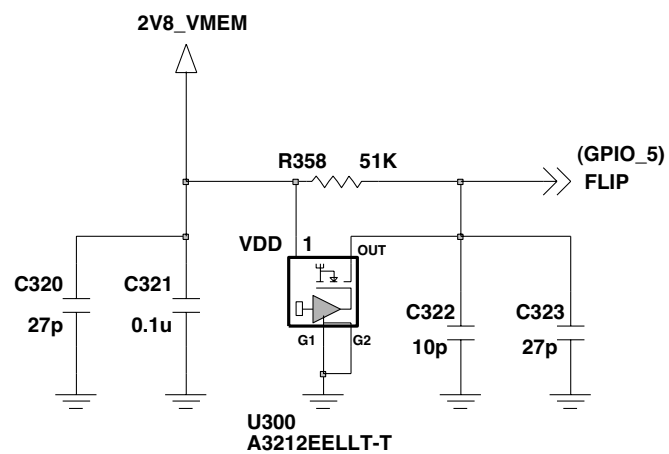
### 4.17 Folder on/off Trouble

#### TEST POINT



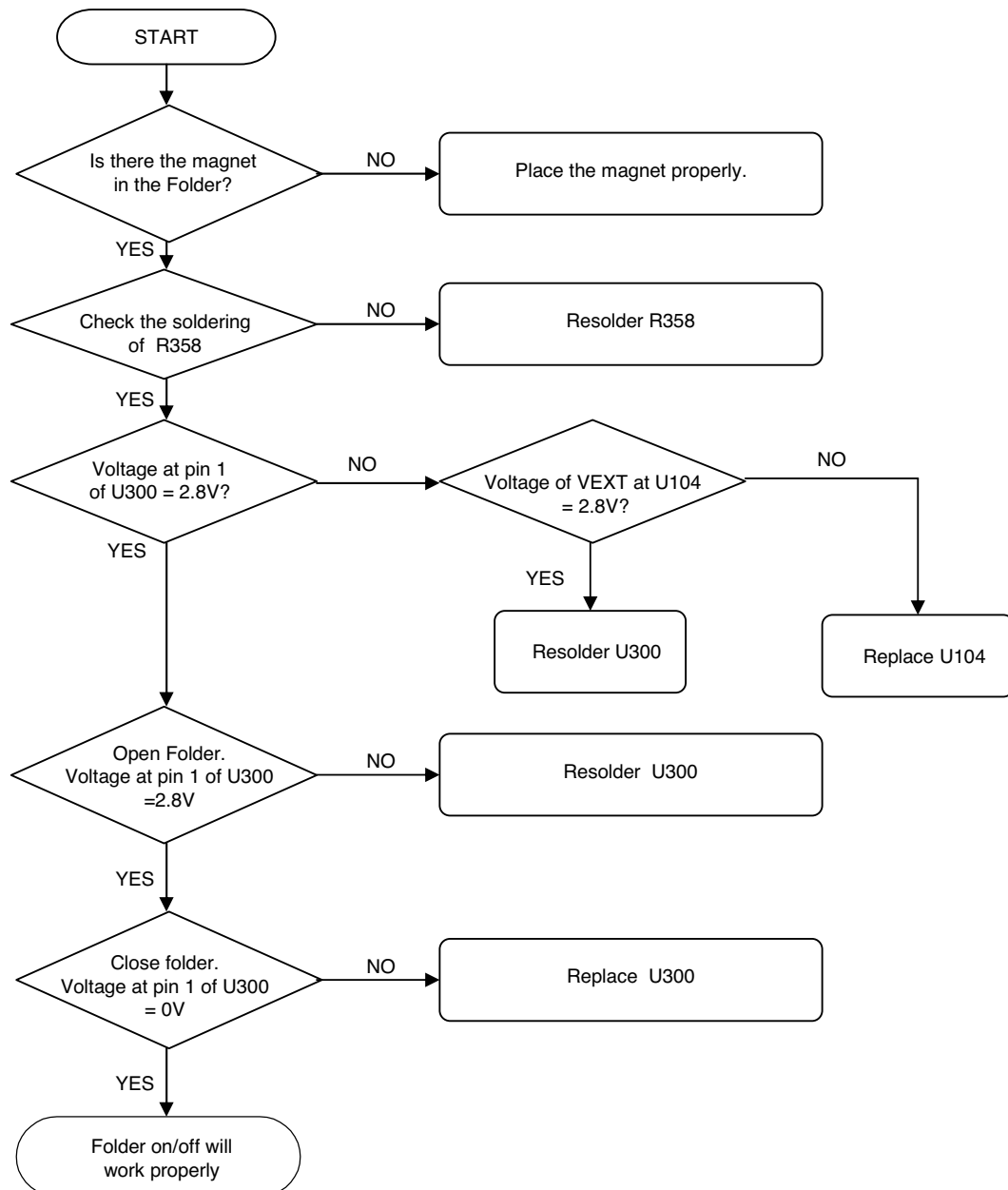
**Figure 4.17**

#### CIRCUIT



## 4. TROUBLE SHOOTING

### Checking Flow

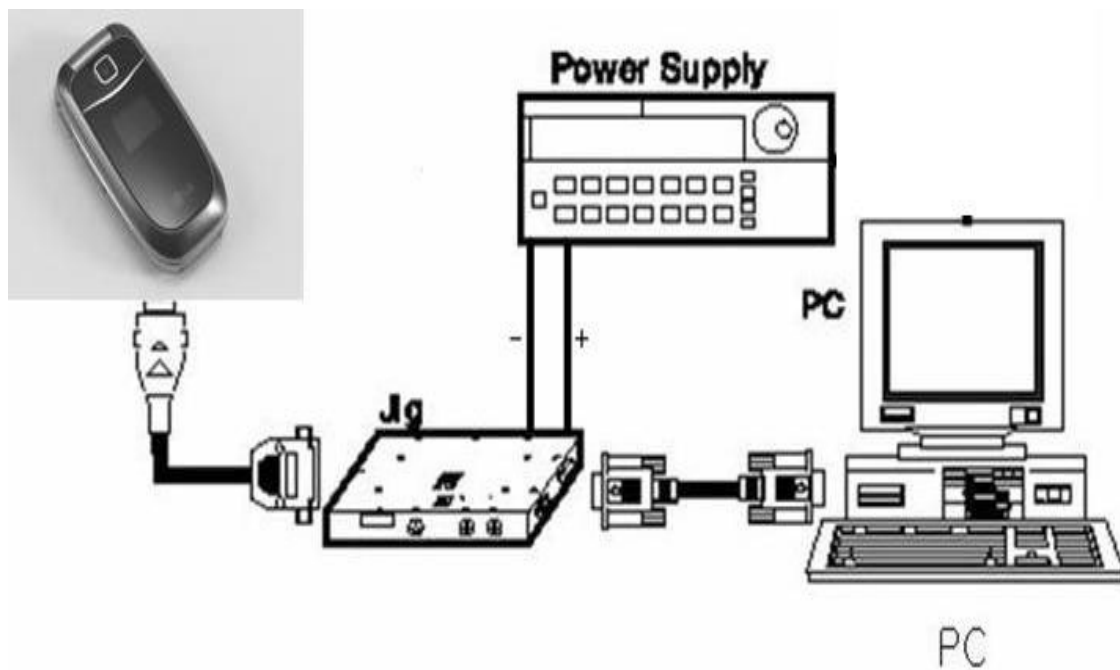


## 5. DOWNLOAD

### 5.1 Download

#### A. Download Setup

Figure 5.1 describes Download setup



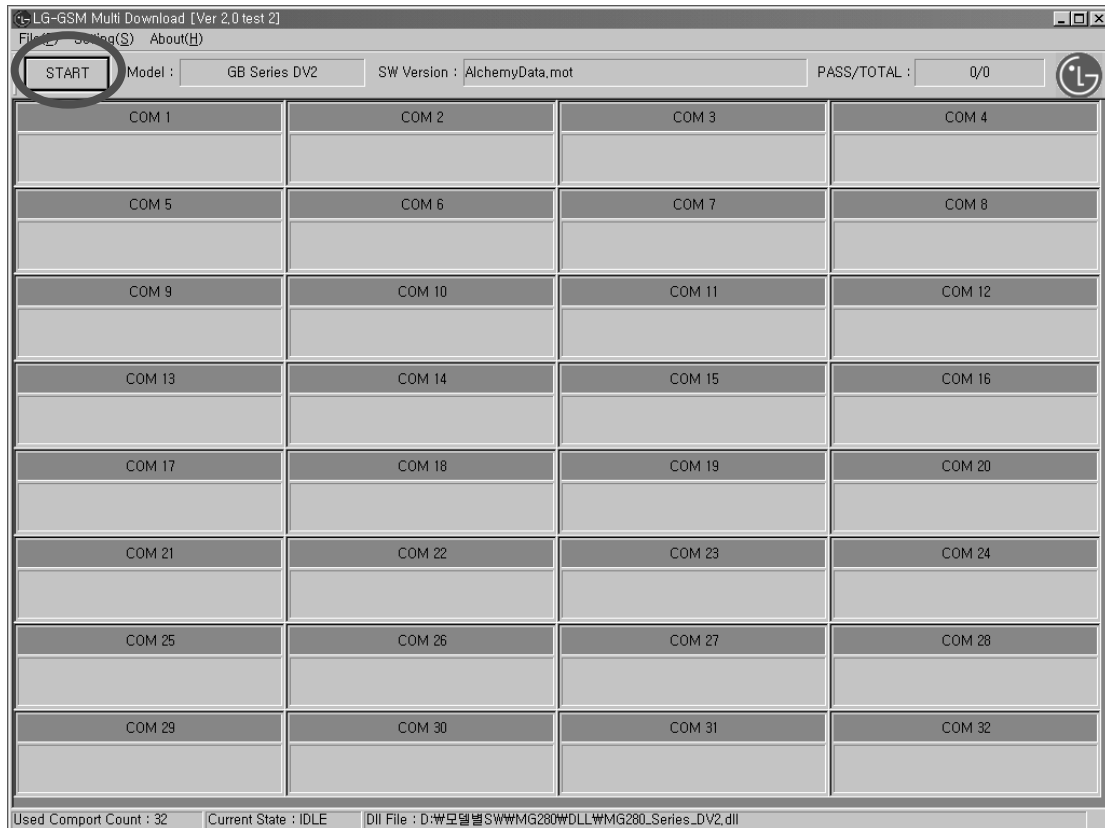
**Figure 5.1 Download Setup**



## 5. DOWNLOAD

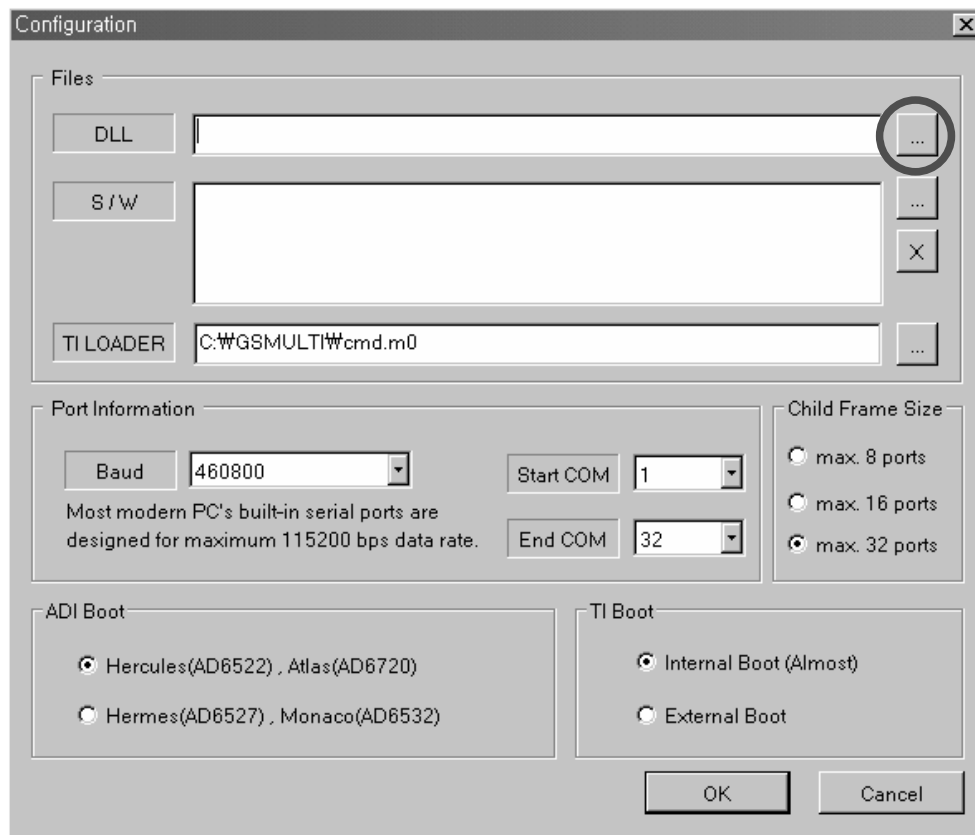
### B. Multi Download Procedure

1. Run GSM Multi Download program and select Setting

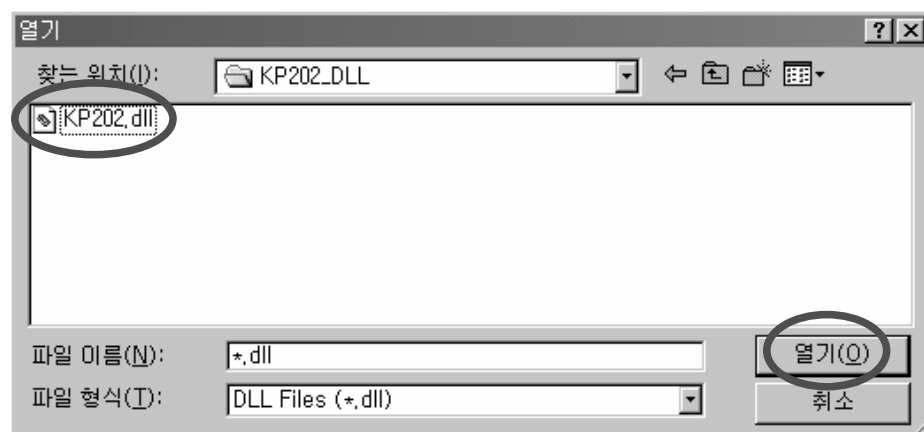


## 5. DOWNLOAD


2. Select Configuration from the menu and you may see this window

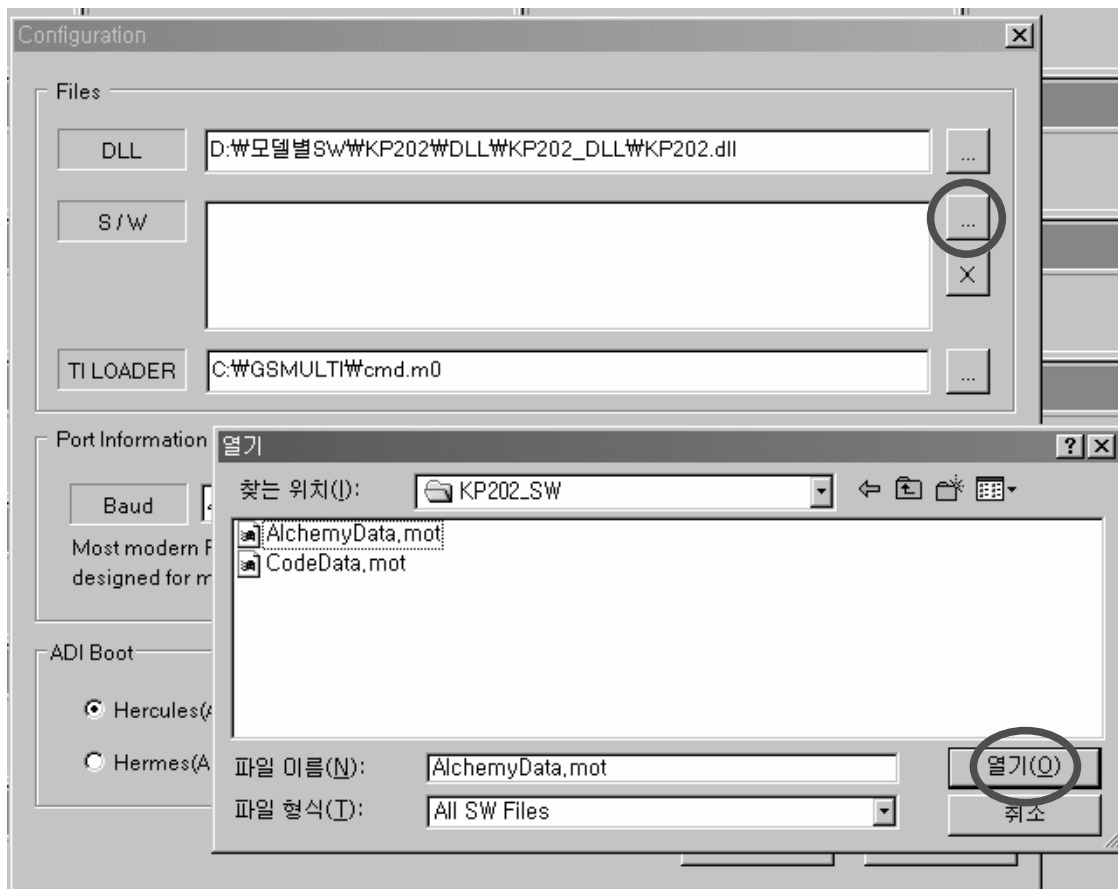


3. Press  key to select DLL file and press Open



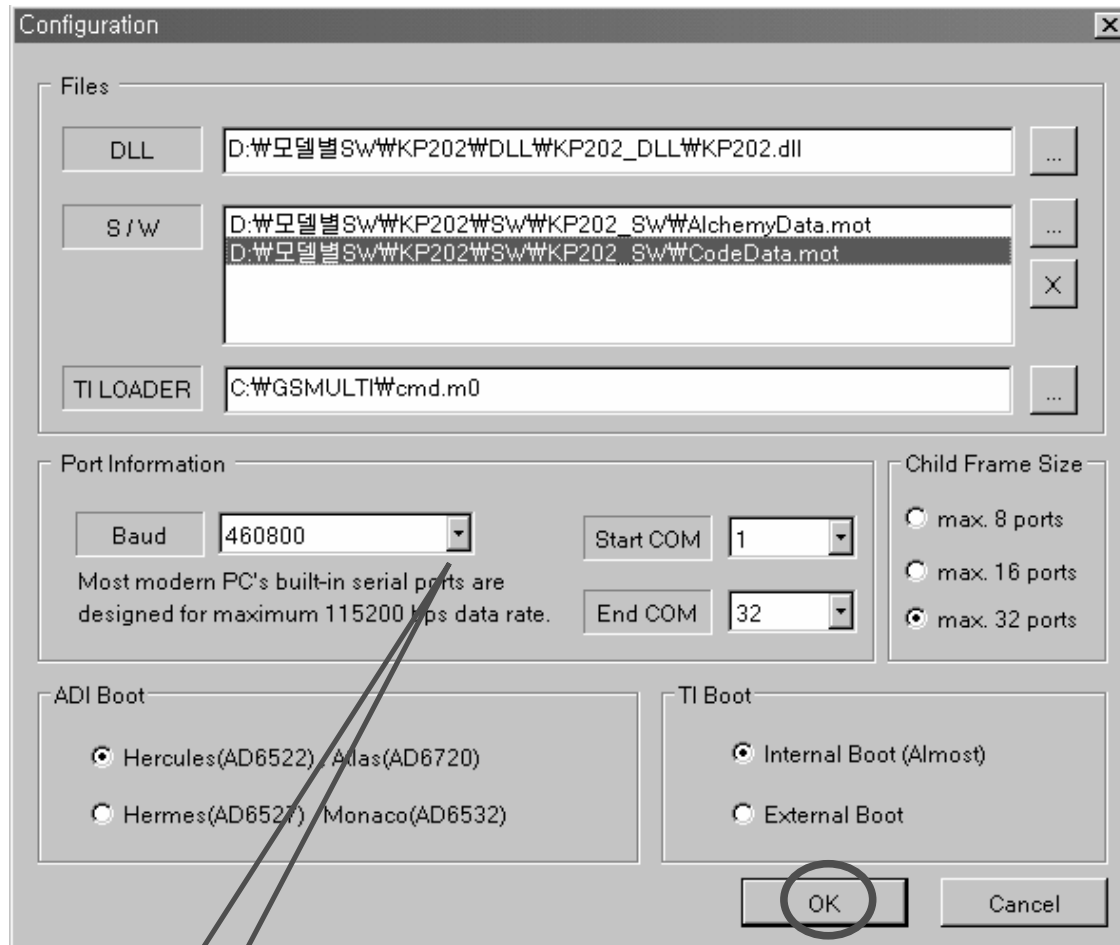
## 5. DOWNLOAD

4. Press  key to select the mot files
5. Select AlchemyData.mot and press open
6. Repeat step 4-5 to select CodeData.mot



## 5. DOWNLOAD

7. Check if the ADI option is set to Hermes
8. Press OK to end Configuration



Select Rate



## 6. BLOCK DIAGRAM

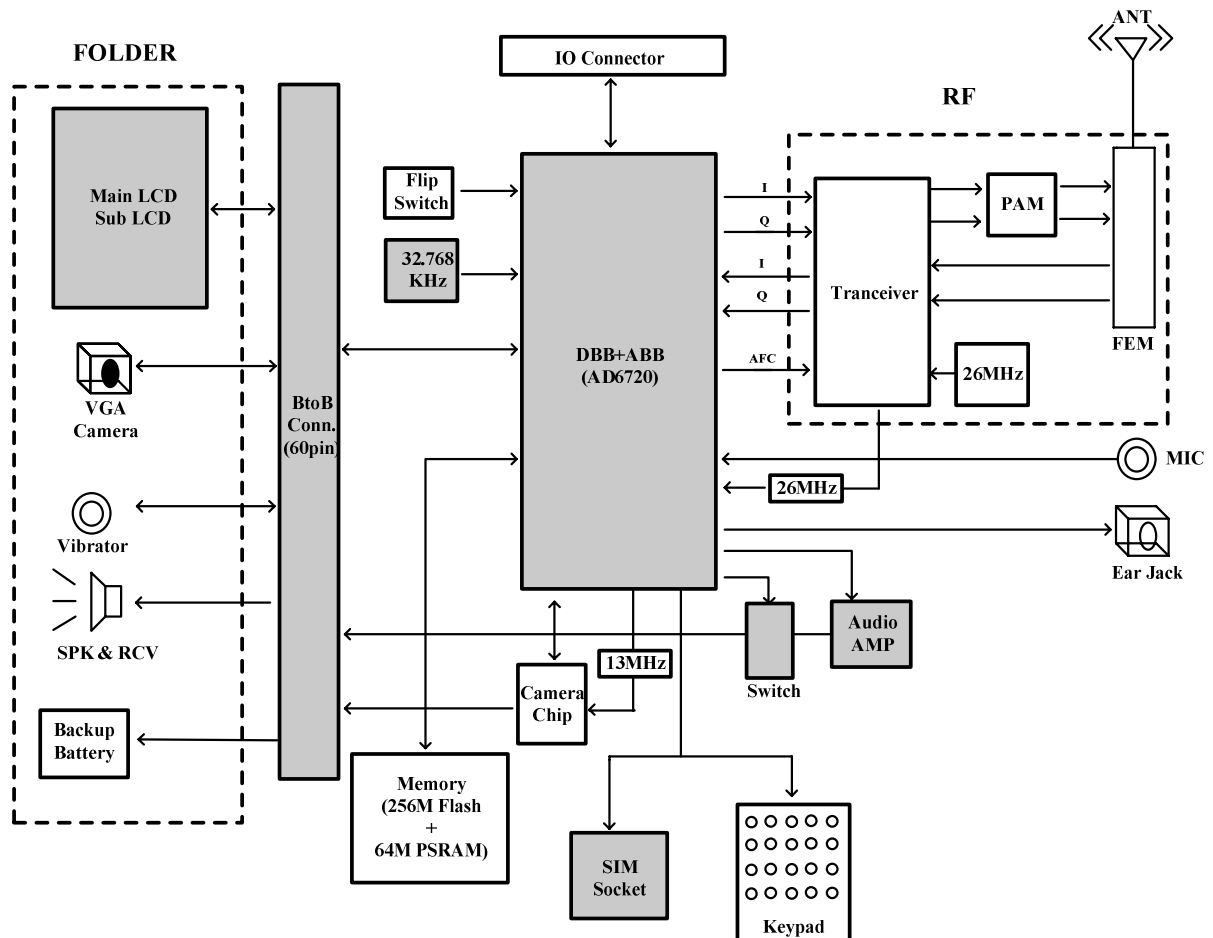
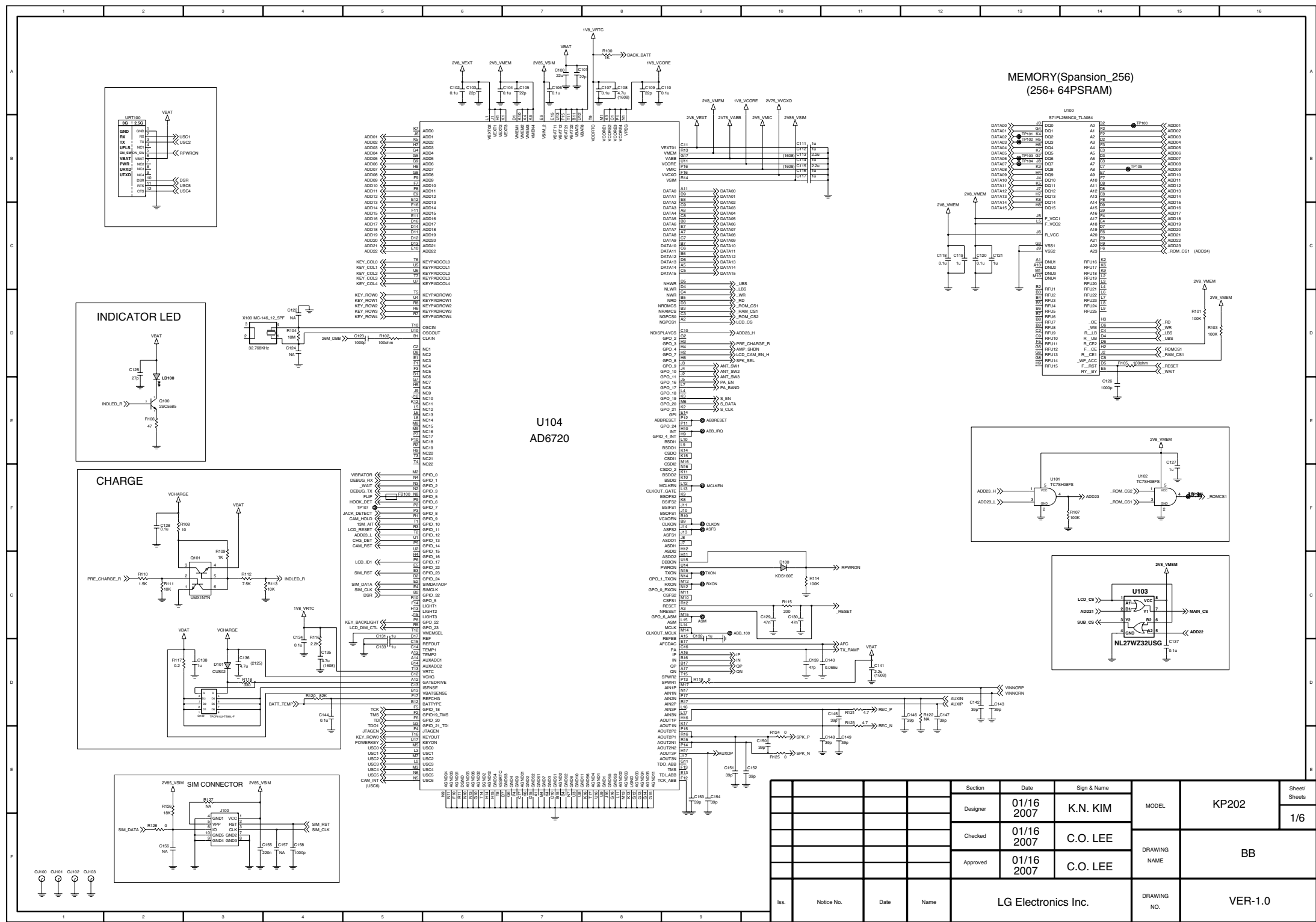


Figure 8.1 LG-KP202 Block Diagram

---

7. CIRCUIT DIAGRAM



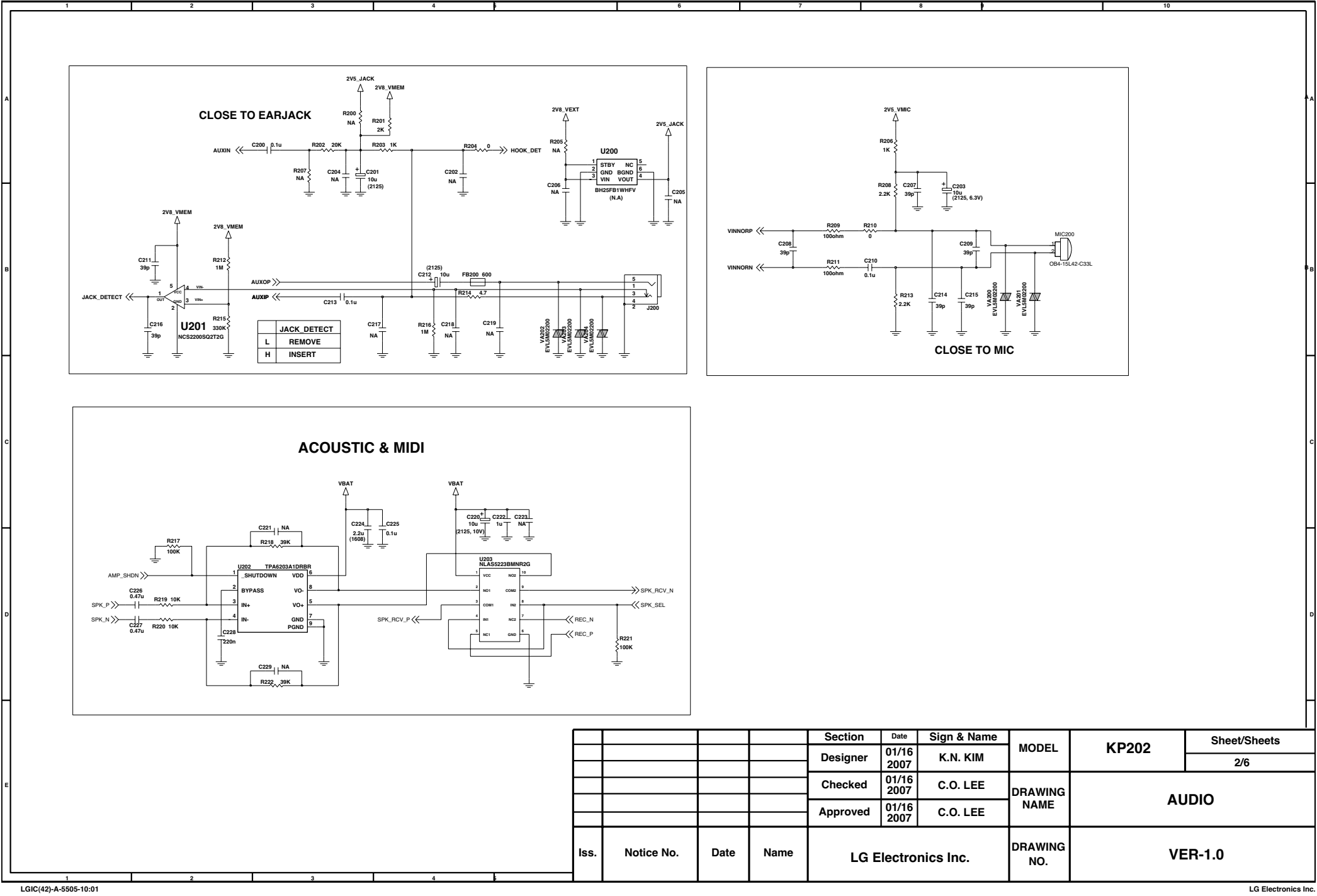
LG(42)-A-5505-10-01

LGMC

LG Electronics Inc.



7. CIRCUIT DIAGRAM



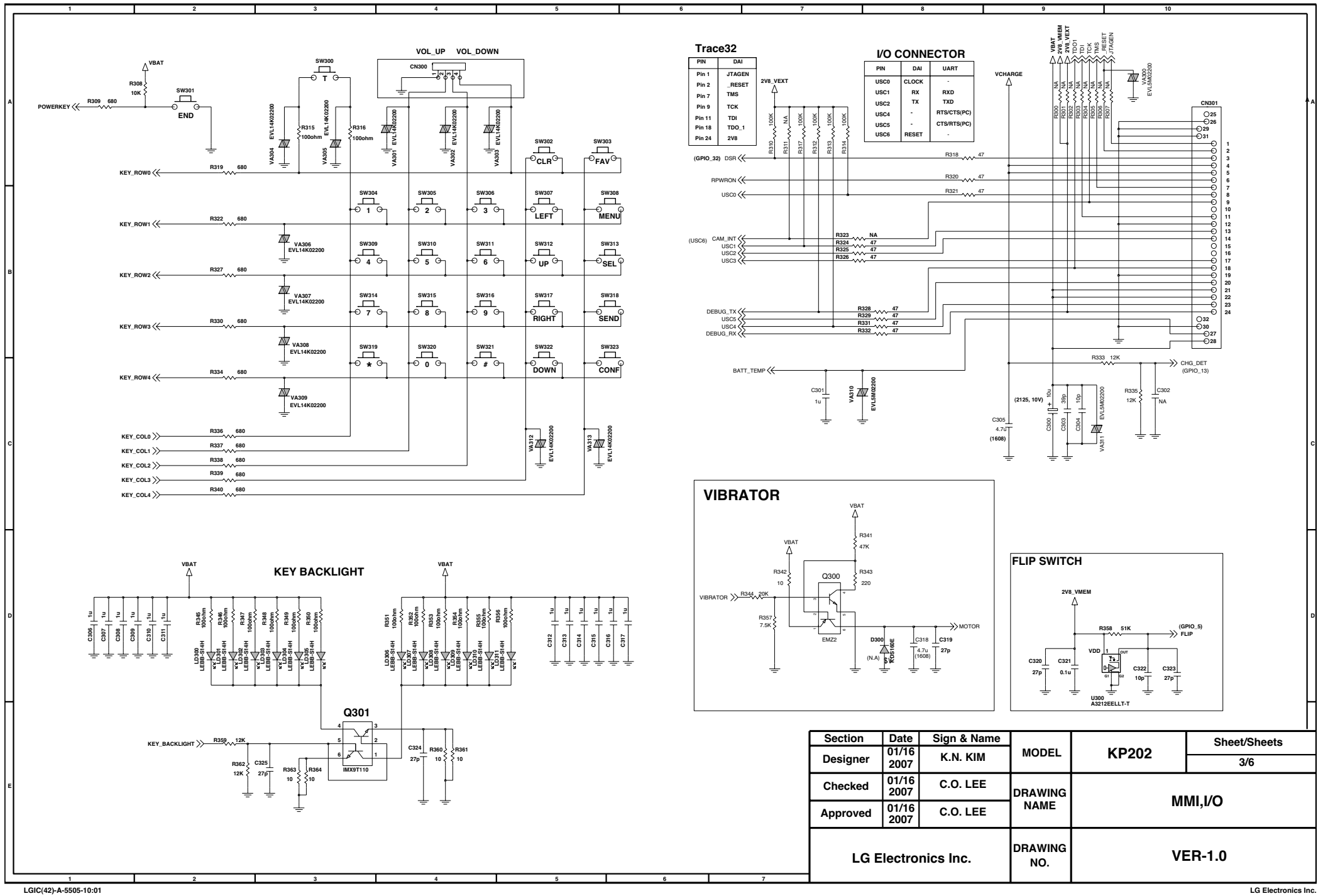
LGIC(42)-A-5505-10:01

LGIC

LG Electronics Inc.

				Section	Date	Sign & Name	MODEL	KP202	Sheet/Sheets
				Designer	01/16 2007	K.N. KIM			2/6
				Checked	01/16 2007	C.O. LEE	DRAWING NAME	AUDIO	
				Approved	01/16 2007	C.O. LEE			
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER-1.0	

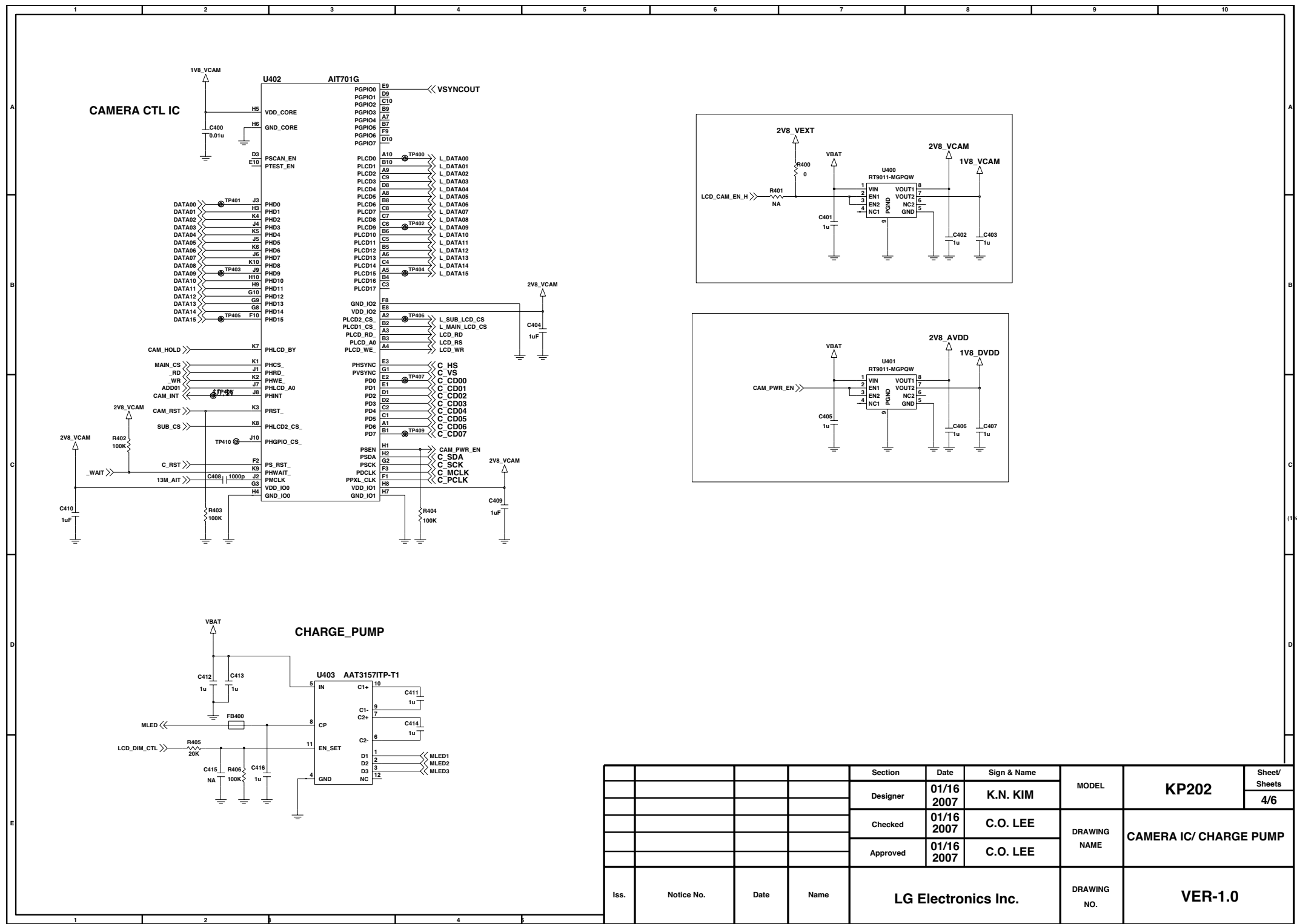
7. CIRCUIT DIAGRAM



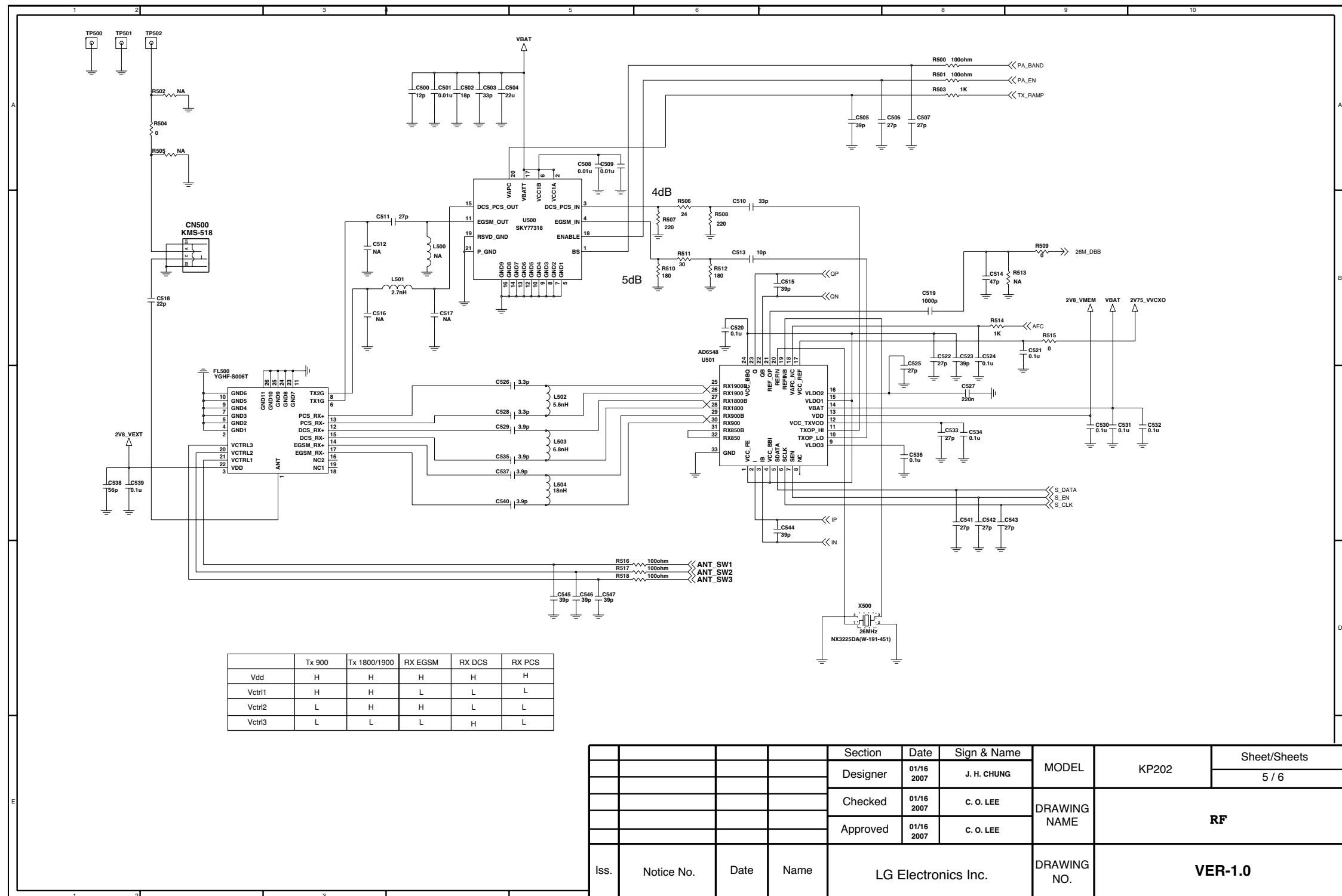
LGIC(42)-A-5505-10:01

LG Electronics Inc.

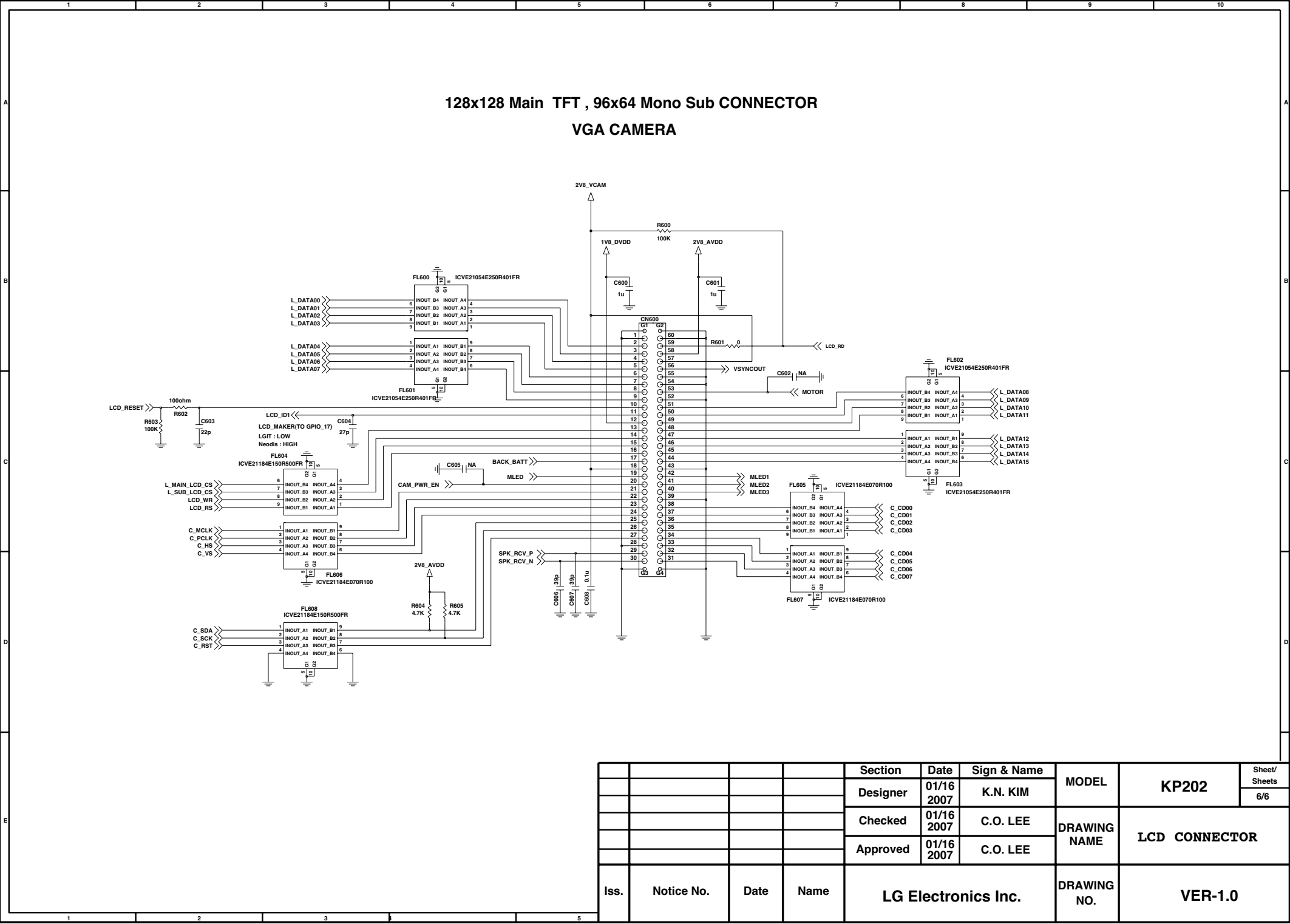
## 7. CIRCUIT DIAGRAM



## 7. CIRCUIT DIAGRAM



7. CIRCUIT DIAGRAM

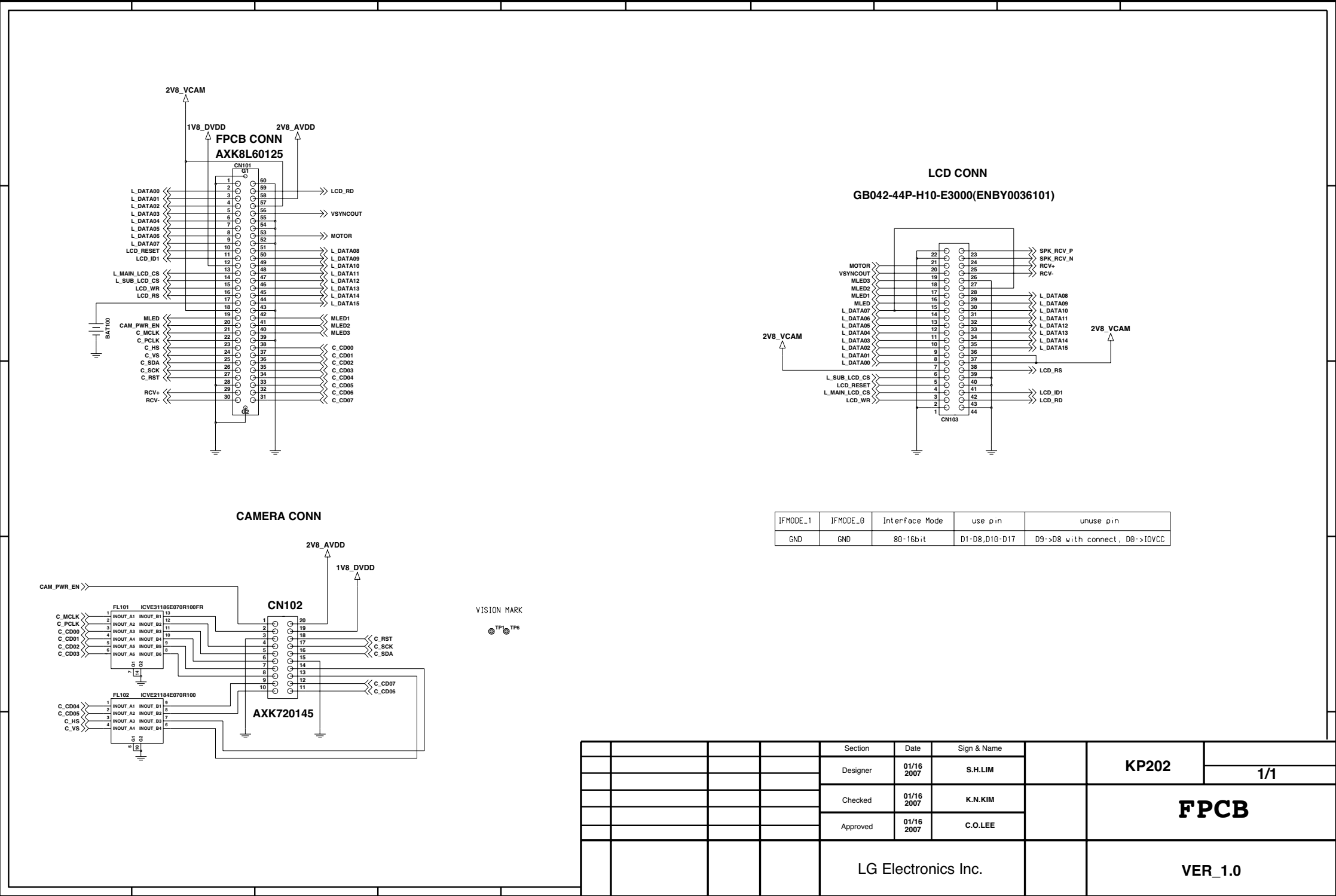


				Section	Date	Sign & Name	MODEL	KP202	Sheet/ Sheets
				Designer	01/16 2007	K.N. KIM			6/6
				Checked	01/16 2007	C.O. LEE	DRAWING NAME	LCD CONNECTOR	
				Approved	01/16 2007	C.O. LEE			
Iss.	Notice No.	Date	Name	LG Electronics Inc.			DRAWING NO.	VER-1.0	

LGIC(42)-A-5505-10:01

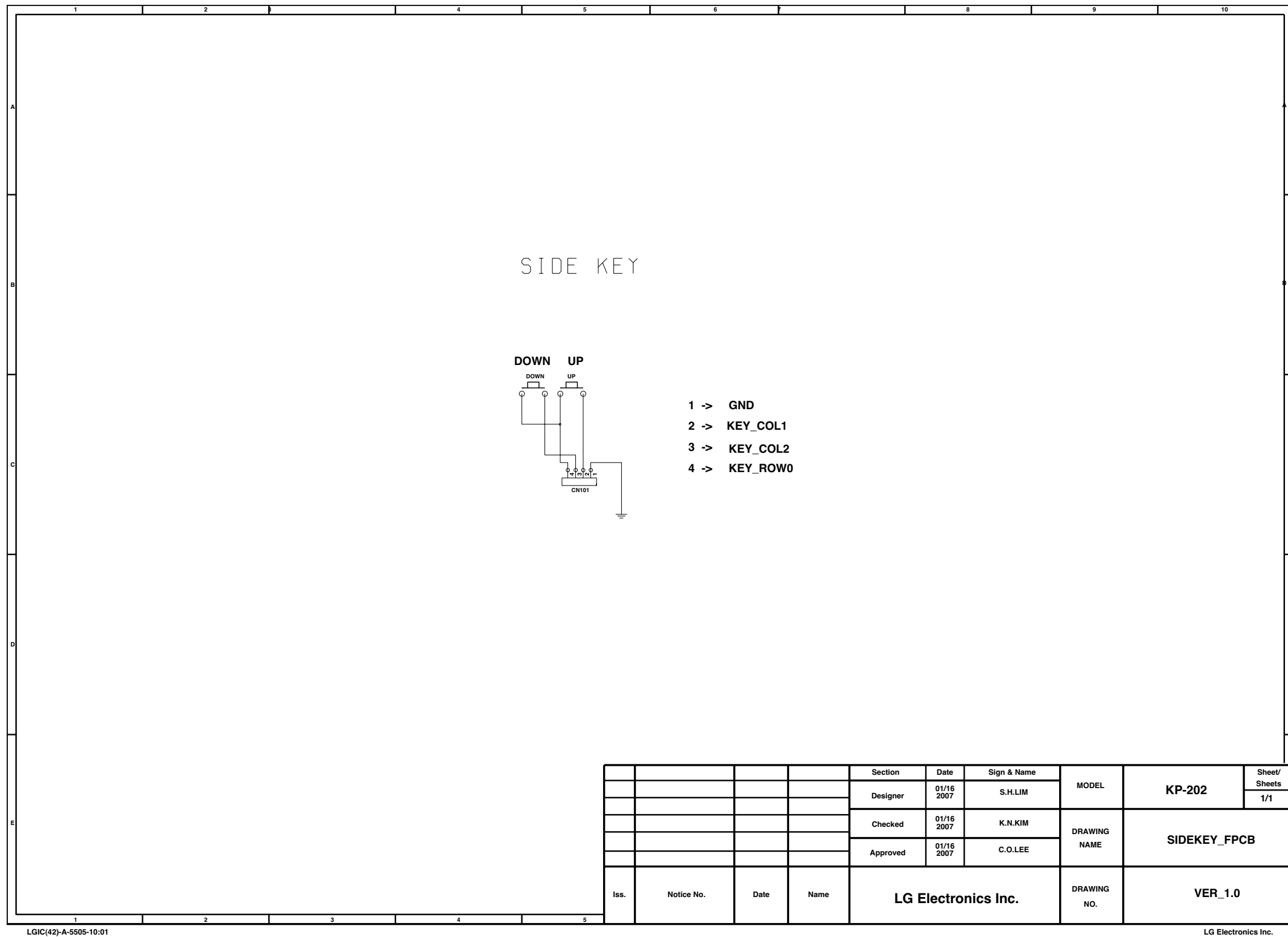
LG Electronics Inc.

7. CIRCUIT DIAGRAM

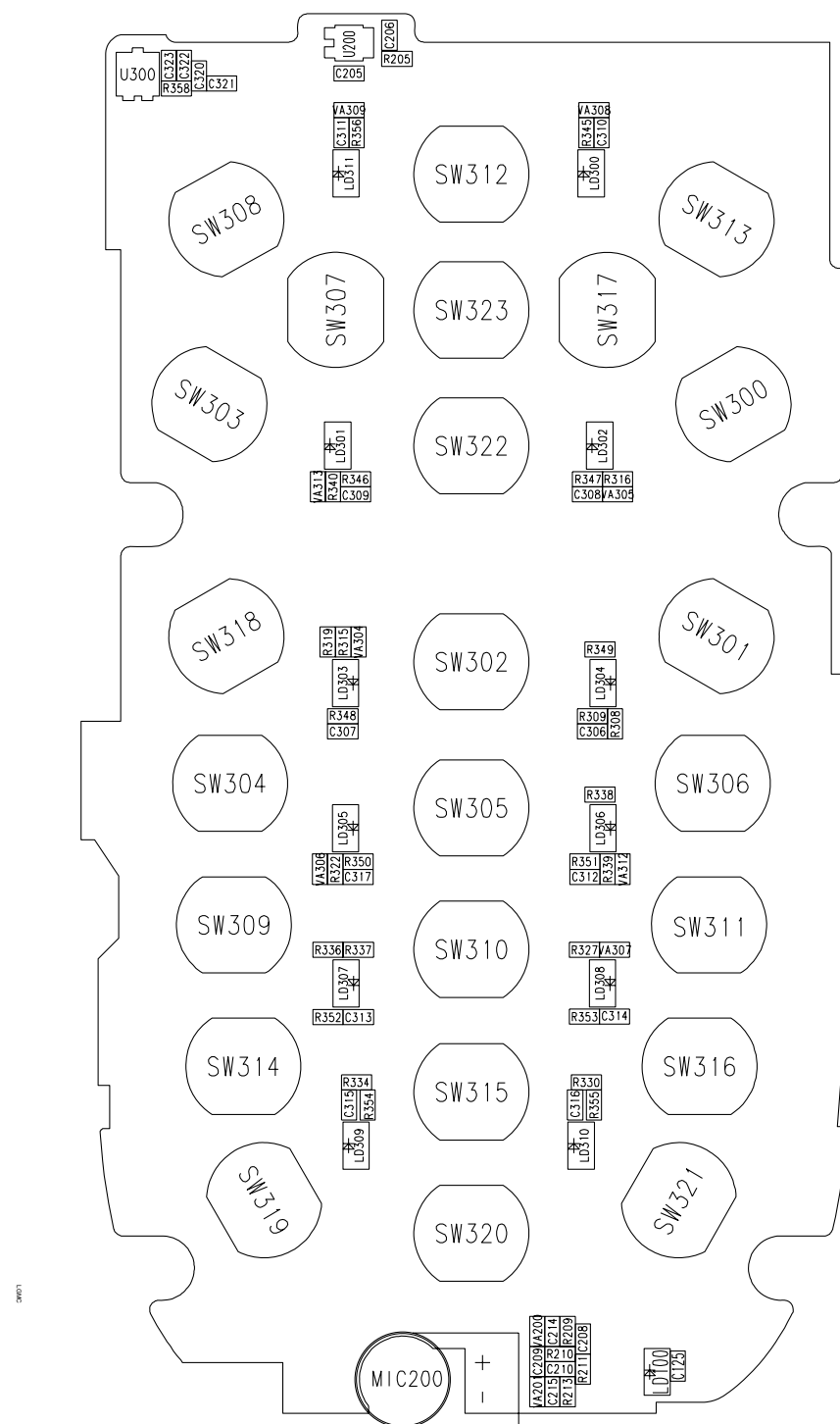


				Section	Date	Sign & Name		KP202	1/1
				Designer	01/16 2007	S.H.LIM		FPCB	
				Checked	01/16 2007	K.N.KIM			
				Approved	01/16 2007	C.O.LEE			
				LG Electronics Inc.				VER_1.0	

## 7. CIRCUIT DIAGRAM



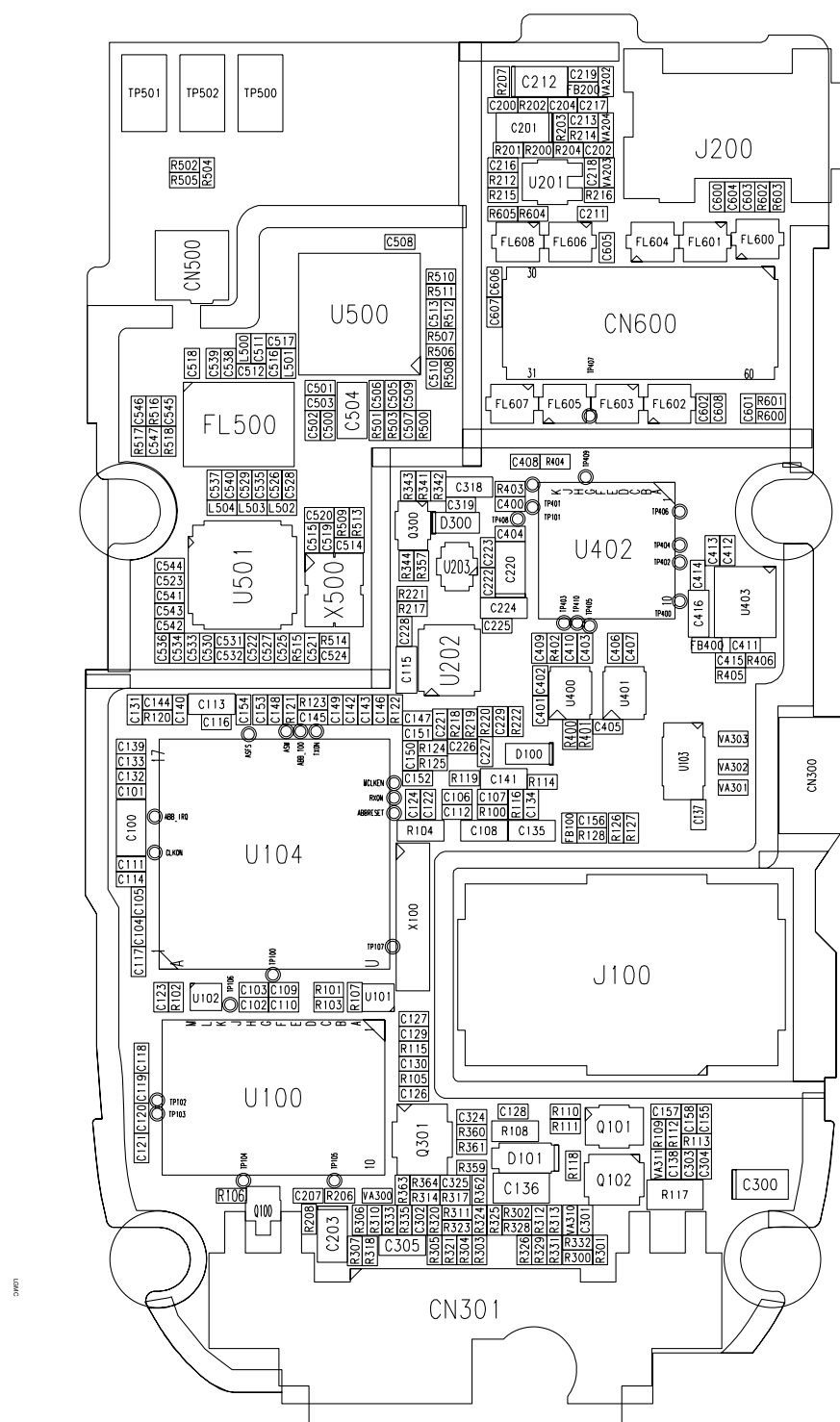
## 8. PCB LAYOUT



KP202-MAIN-1.0-TOP

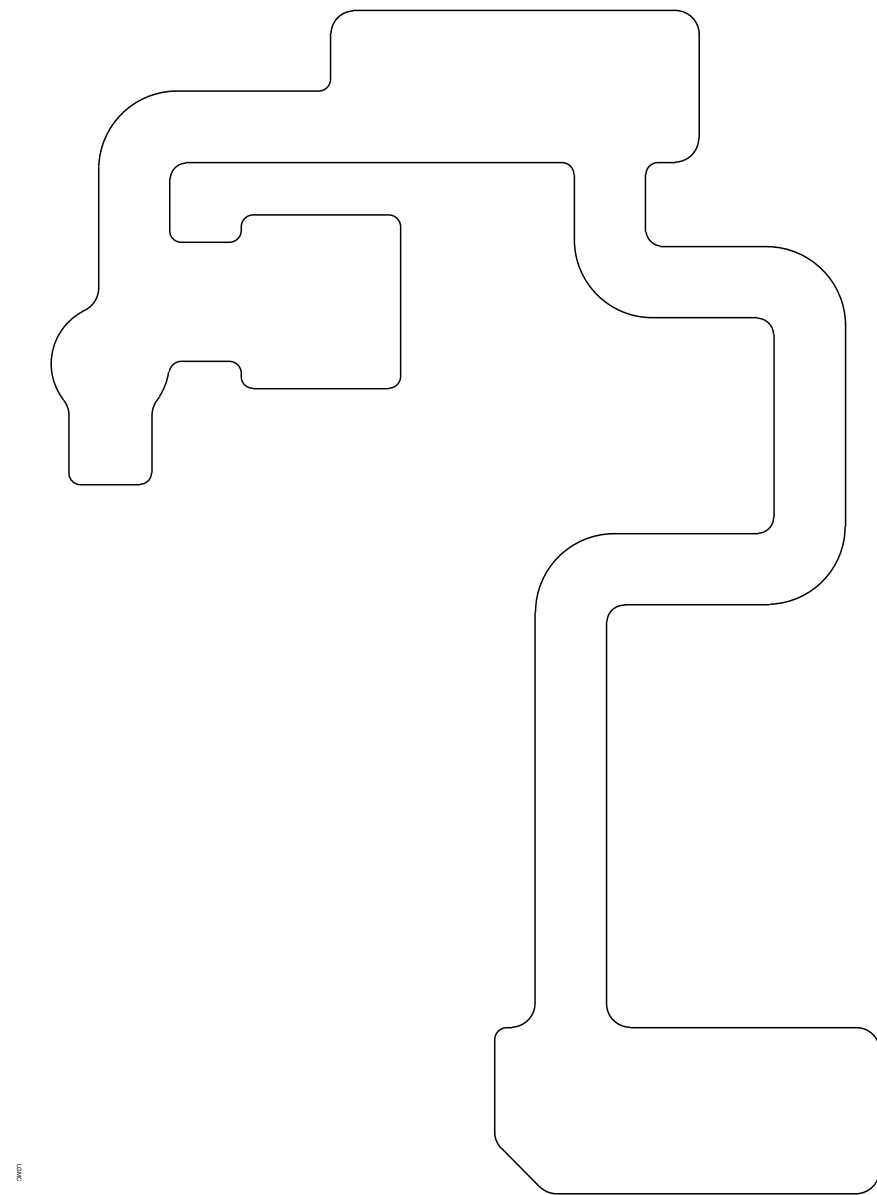


## 8. PCB LAYOUT



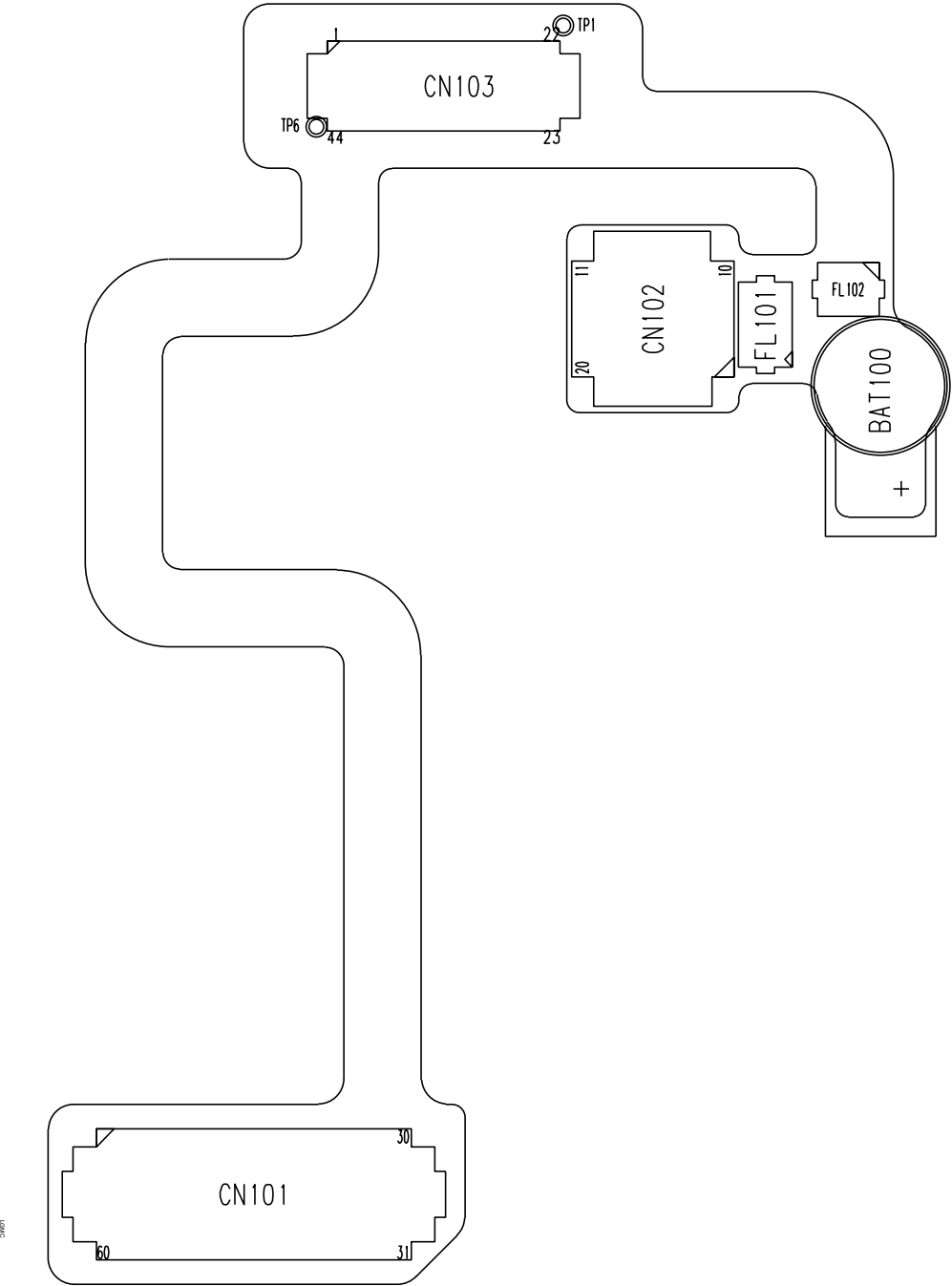
KP202-MAIN-1.0-BOT

## 8. PCB LAYOUT



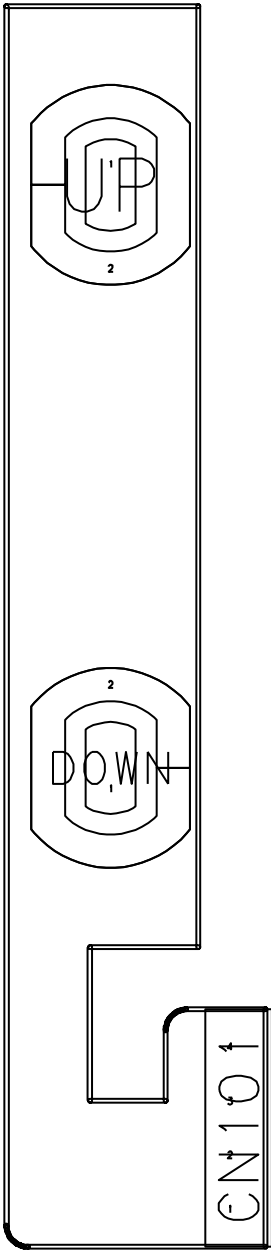
KP202-F-LCD-1.0-T0P

8. PCB LAYOUT



KP202-F-LCD-1.0-B0T

8. PCB LAYOUT





## 9. ENGINEERING MODE

### A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

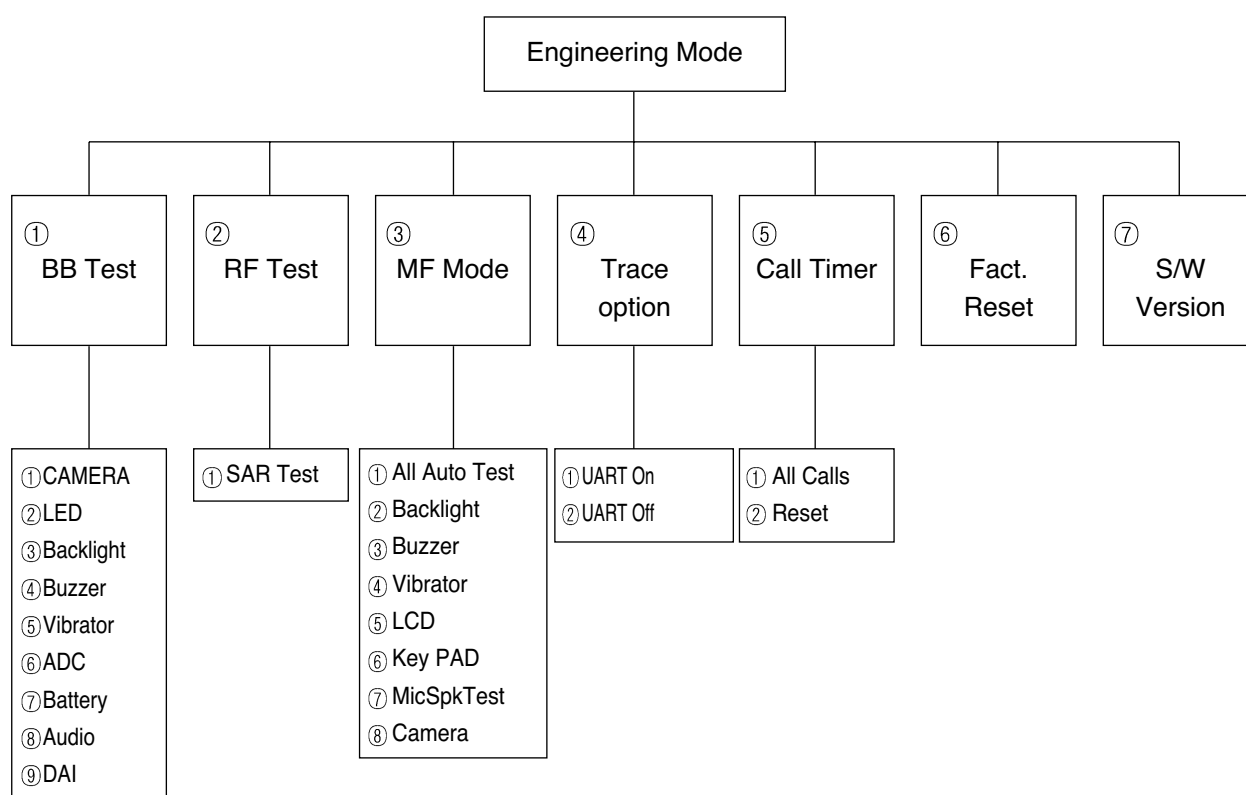
### B. Access Codes

The key sequence for switching the engineering mode on is 2945##. Pressing END will switch back to non-engineering mode operation.

### C. Key Operation

Use Up and Down key to select a menu and press 'select' key to progress the test. Pressing 'back' key will switch back to the original test menu.

### D. Engineering Mode Menu Tree



## 9. ENGINEERING MODE

---

### 9.1 BB Test [MENU 1]

#### 9.1.1 CAMERA

This menu is to test the Camera.

- 1) Main LCD preview : It shows the picture on Main LCD.

#### 9.1.2 LCD

- 1) Brightness
- 2) COLOUR : WHITE, RED, GREEN, BLUE, BLACK

#### 9.1.3 Backlight

This menu is to test the LCD Backlight.

- 1) Backlight on : LCD Backlight on.
- 2) Backlight off : LCD Backlight off.
- 3) Backlight value : This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left/Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

#### 9.1.4 Buzzer

This menu is to test the melody sound.

- 1) Melody on : Melody sound is played through the speaker.
- 2) Melody off : Melody sound is off.

#### 9.1.5 Vibrator

This menu is to test the vibration mode.

- 1) Vibrator on : Vibration mode is on.
- 2) Vibrator off : Vibration mode is off.

### 9.1.6 ADC (Analog to Digital Converter)

This displays the value of each ADC.

- 1) MVBAT ADC : Main Voltage Battery ADC
- 2) AUX ADC : Auxiliary ADC
- 3) TEMPER ADC : Temperature ADC

### 9.1.7 BATTERY

- 1) Bat Cal : This displays the value of Battery Calibration. The following menus are displayed in order :  
BAT\_LEV\_4V, BAT\_LEV\_3\_LIMIT, BAT\_LEV\_2\_LIMIT, BAT\_LEV\_1\_LIMIT,  
BAT\_IDLE\_LIMIT, BAT\_INCALL\_LIMIT, SHUT\_DOWN\_VOLTAGE,  
BAT\_RECHARGE\_LMT
- 2) TEMP Cal : This displays the value of Temperature Calibration. The following menus are displayed  
in order : TEMP\_HIGH\_LIMIT, TEMP\_HIGH\_RECHARGE\_LMT,  
TEMP\_LOW\_RECHARGE\_LMT, TEMP\_LOW\_LIMIT

### 9.1.8 Audio

This is NOT a necessary menu to be used by neither engineers nor users.

### 9.1.9 DAI (Digital Audio Interface)

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) DAI AUDIO : DAI audio mode
- 2) DAI UPLINK : Speech encoder test
- 3) DAI DOWNLINK : Speech decoder test
- 4) DAI OFF : DAI mode off



## 9. ENGINEERING MODE

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### 9.2 RF Test [MENU 2]

#### 9.2.1 SAR test

This menu is to test the Specific Absorption Rate.

- 1) SAR test on : Phone continuously process TX only. Call-setup equipment is not required.
- 2) SAR test off : TX process off

### 9.3 MF mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

#### 9.3.1 All auto test

LCD, Backlight, Vibrator, Buzzer, Key Pad, Mic & Speaker,

#### 9.3.2 Backlight

LCD Backlight is on for about 1.5 seconds at the same time, then off.

#### 9.3.3 Buzzer

This menu is to test the volume of Melody. It rings in the following sequence. Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

#### 9.3.4 Vibrator

Vibrator is on for about 1.5 seconds.

#### 9.3.5 LCD

- 1) LCD

Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.

#### 9.3.6 Key pad

When a pop-up message shows 'Press Any Key', you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 seconds automatically.

### 9.3.7 MicSpk Test

The sound from MIC is recorded for about 3 seconds, then it is replayed on the speaker automatically.

### 9.3.8 Camera Test

This menu is to test camera (preview and capture automatically.)

## 9.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

## 9.5 Call timer [MENU 5]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.

- 1) All calls : This displays total conversation time. User cannot reset this value.
- 2) Reset settings : This resets total conversation time to this, [00:00:00].

## 9.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

### Attention

- ① Fact. Reset (i.e. Factory Reset) should be only used during the Manufacturing process.
- ② Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

## 9.7 S/W version

This displays software version stored in the phone.

## 10. STAND ALONE TEST

---

## 10. STAND ALONE TEST

### 10.1 Introduction

This manual explains how to examine the status of RX and TX of the model.

#### A. Tx Test

TX test - this is to see if the transmitter of the phones is activating normally.

#### B. Rx Test

RX test - this is to see if the receiver of the phones is activating normally.

### 10.2 Setting Method

#### A. COM port

- a. Move your mouse on the "Option" button, then click the right button of the mouse and select "Com setting".
- b. In the "Dialog Menu", select the values as explained below.
  - Port : select a correct COM port
  - Baud rate : 38400
  - Leave the rest as default values

#### B. Tx

1. Selecting Channel
  - Select one of GSM or DCS/PCS Band and input appropriate channel.
2. Selecting APC
  - a. Select either Power level or Scaling Factor.
  - b. Power level
    - Input appropriate value GSM (between 5~19) or DCS/PCS (between 0~15)
  - c. Scaling Factor
    - A 'Ramp Factor' appears on the screen.
    - You may adjust the shape of the Ramp or directly input the values.

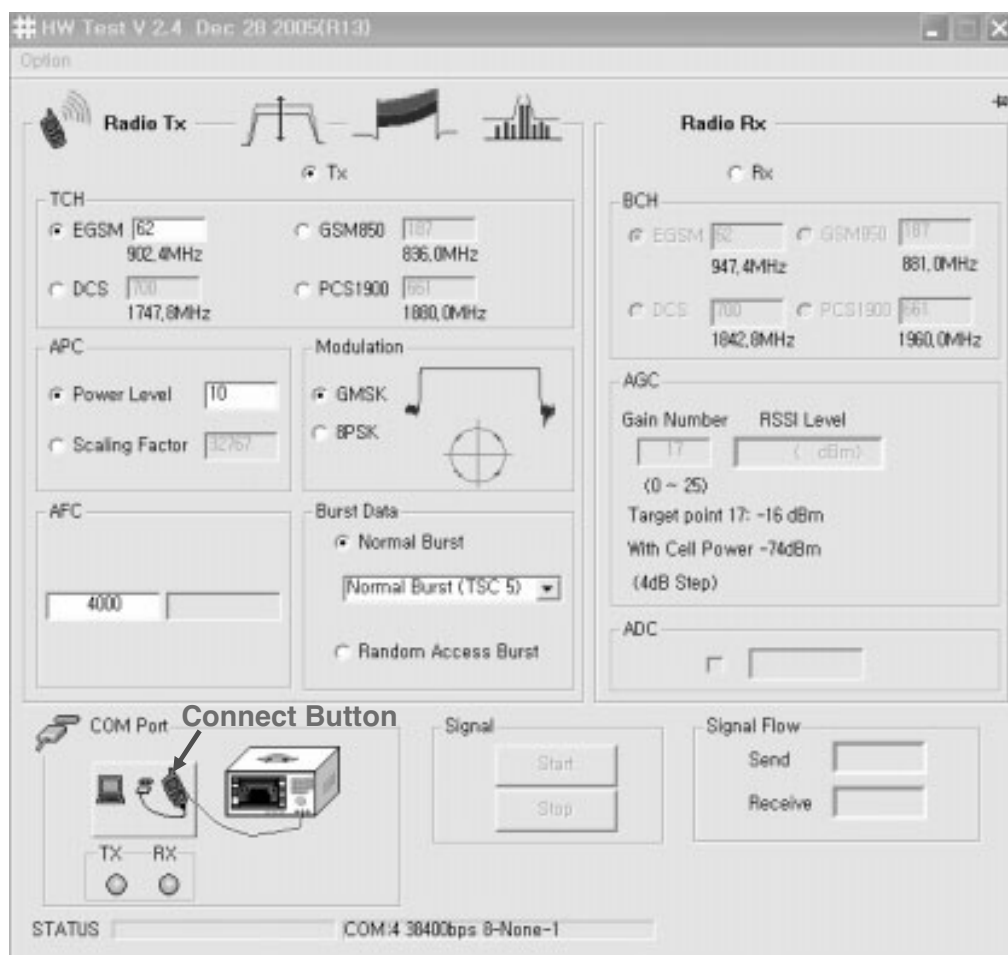
#### C. Rx

1. Selecting Channel
  - Select one of GSM or DCS/PCS Band and input appropriate channel.
2. Gain Control Index (0~ 26) and RSSI level
  - See if the value of RSSI is close to -16dBm when setting the value between 0 ~ 26 in Gain Control Index.
  - Normal phone should indicate the value of RSSI close to -16dBm.

## 10. STAND ALONE TEST

### 10.3 Means of Test

- Select a COM port
- Set the values in Tx or Rx
- Select band and channel
- After setting them all above, press connect button.
- Press the start button



**Figure 10.3.1 HW test program**

## 10. STAND ALONE TEST

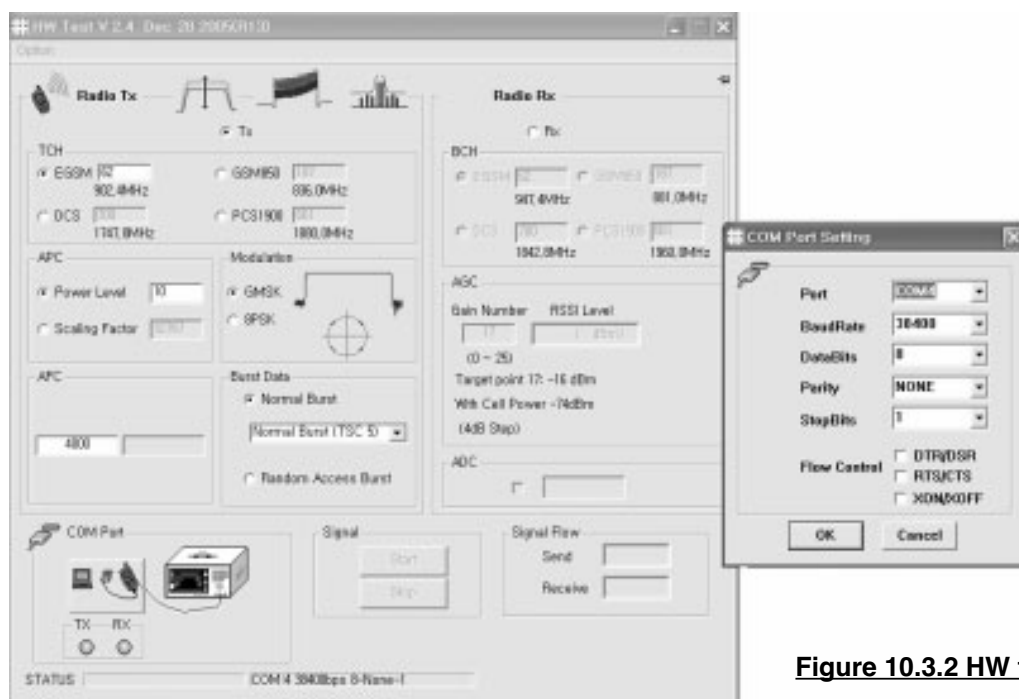


Figure 10.3.2 HW test setting

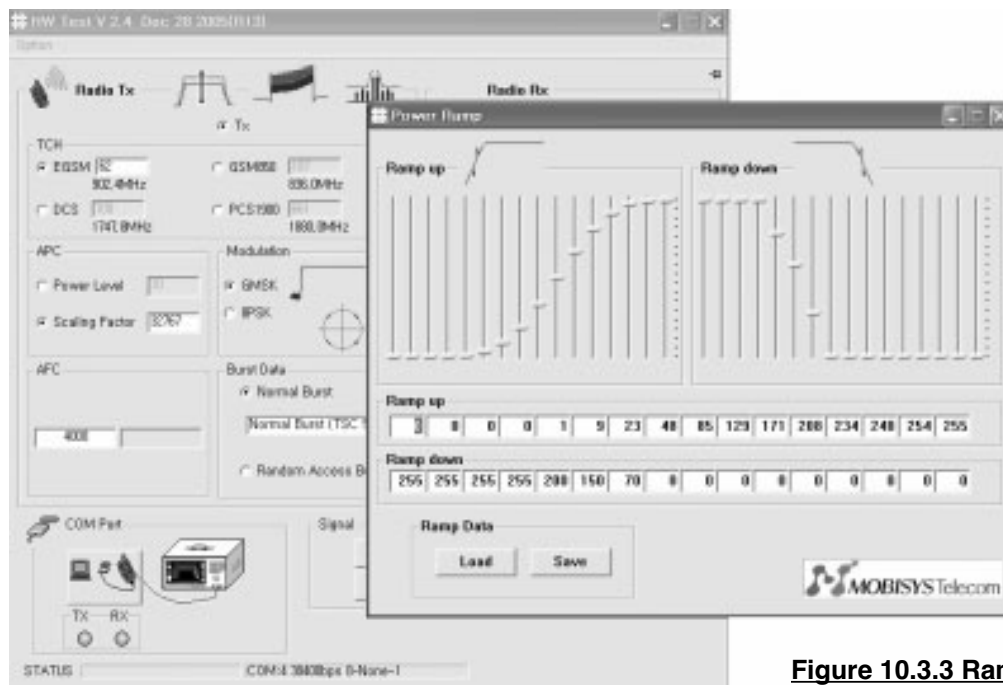


Figure 10.3.3 Ramping profile

## 11. AUTO CALIBRATION

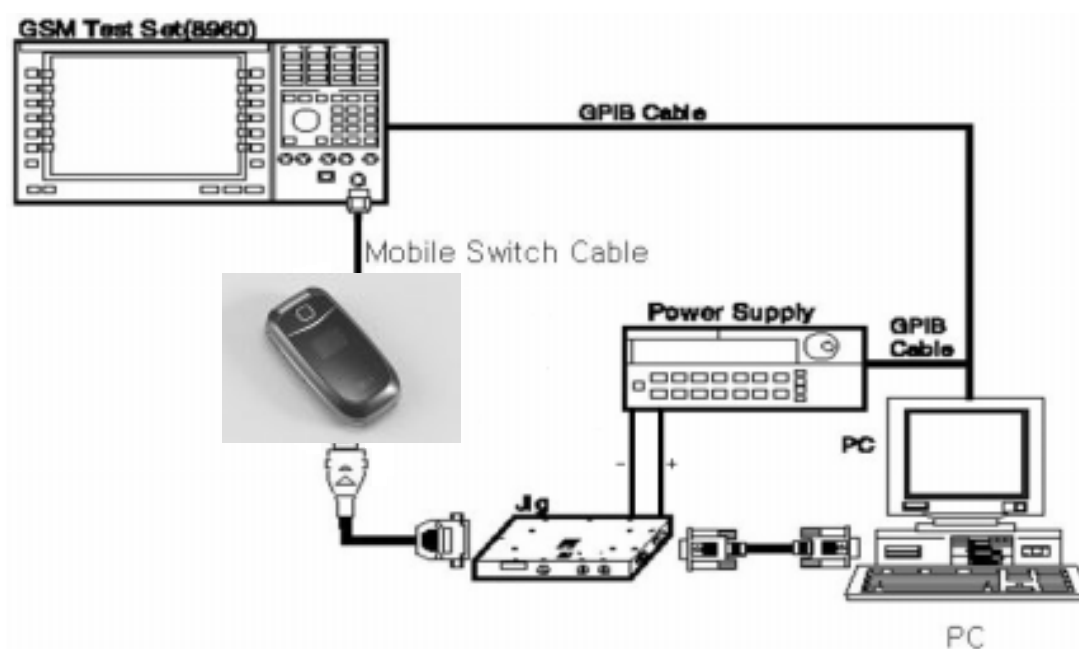
### 11.1 Overview

Auto-cal (Auto Calibration) is the PC side Calibration tool that perform Tx, Rx and Battery Calibration with Agilent 8960(GSM call setting instrument) and Tektronix PS2521G(Programmable Power supply). Auto-cal generates calibration data by communicating with phone and measuring equipment then write it into calibration data block of flash memory in GSM phone.

### 11.2 Equipment List

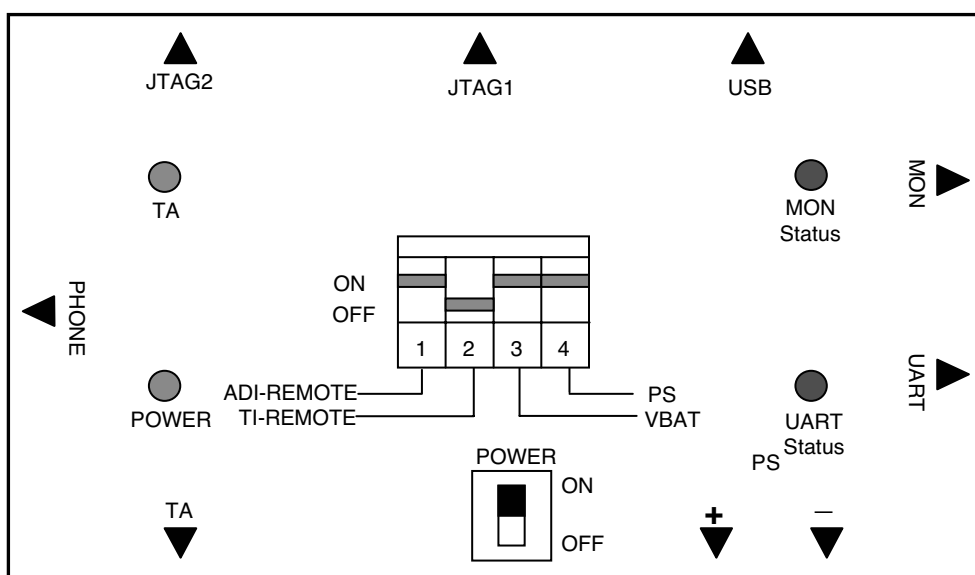
Equipment for Calibration	Type / Model	Brand
Wireless Communication Test Set	HP-8960	Agilent
RS-232 Cable and Test JIG		LG
RF Cable		LG
Power Supply	HP-66311B	Agilent
GPIO interface card	HP-GPIB	Agilent
Calibration & Final test software		LG
Test SIM Card		
PC (for Software Installation)	Pentium II class above 300MHz	

**Table 11.2.1 Calibration Equipment List.**



**Figure 11.2.1 Equipment Setup**

## 11. AUTO CALIBRATION



**Figure 11.2.2 The top view of Test JIG**

### 11.3 Test Jig Operation

Power Source	Description
Power Supply	Usually 4.0V

**Table 11.3.1 Jig Power**

Switch Number	Name	Description
Switch 1	ADI-REMOTE	In ON state, phone is awaked. It is used ADI chipset.
Switch 2	TI-REMOTE	In ON state, phone is awaked. It is used TI chipset.
Switch 3	VBAT	Power is provided for phone from battery
Switch 4	PS	Power is provided for phone from Power supply

**Table 11.3.2 Jig DIP Switch**

LED Number	Name	Description
LED 1	Power	Power is provided for Test Jig
LED 2	TA	Indicate charging state of the phone battery
LED 3	UART	Indicate data transfer state through the UART port
LED 4	MON	Indicate data transfer state through the MON port

**Table 11.3.3 LED Description**

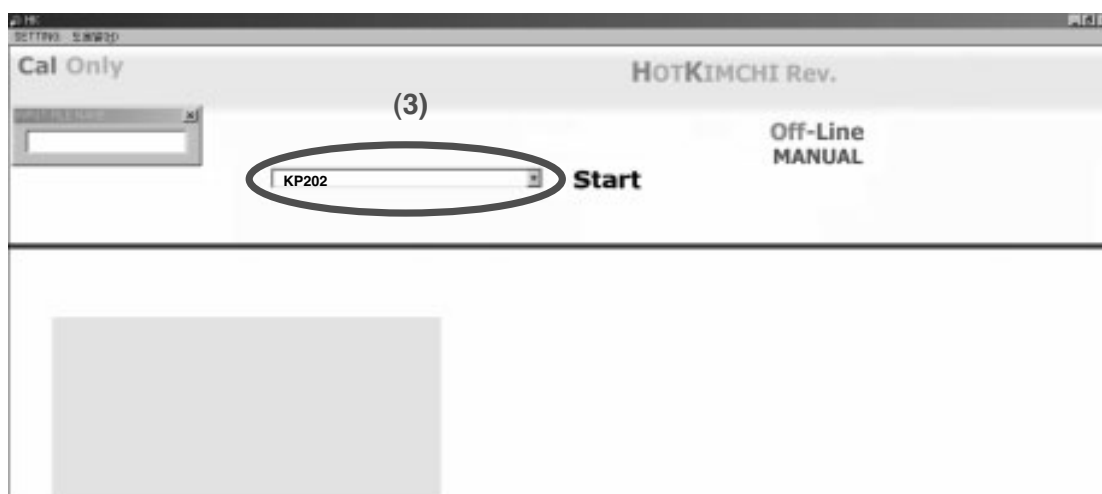
## 11. AUTO CALIBRATION

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1. Connect as Fig 6-2(RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general)
2. Set the Power Supply 4.0V
3. Set the 3<sup>rd</sup>, 4<sup>th</sup> of DIP SW ON state always
4. Press the Phone power key, if the Remote ON is used, 1<sup>st</sup> ON state

### 11.4 Procedure

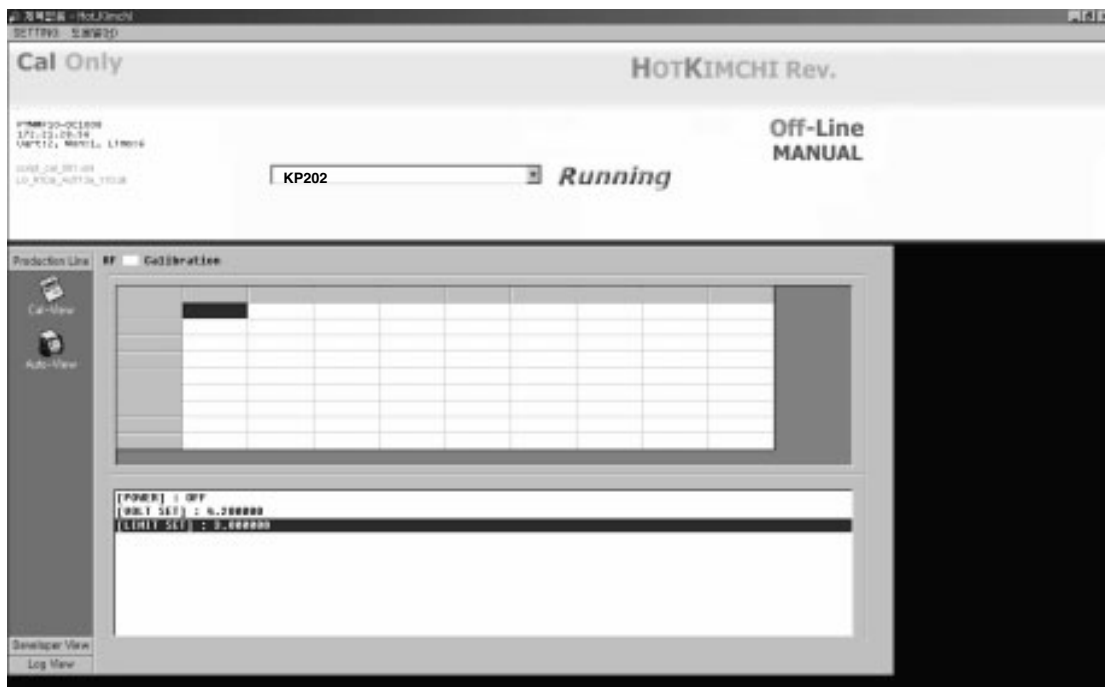
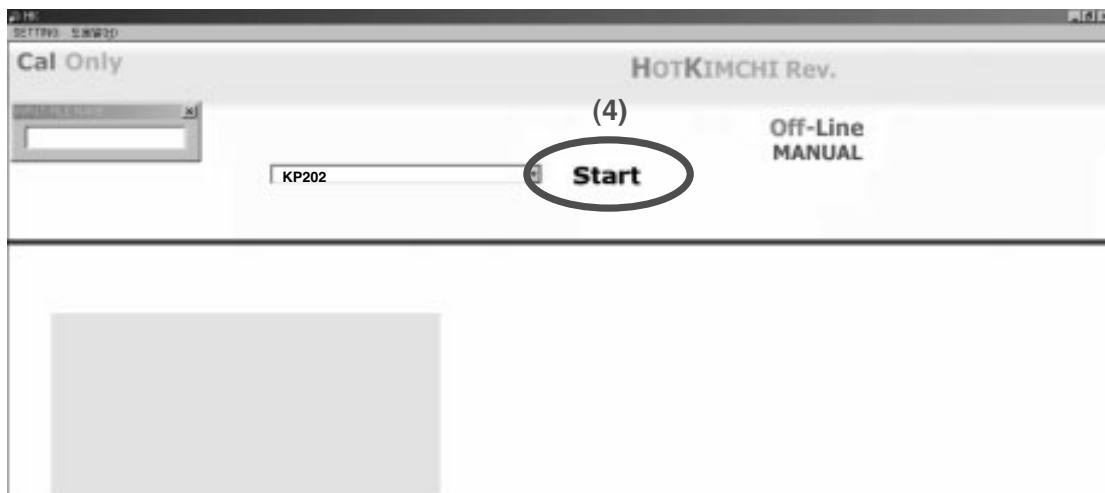
1. Connect as Fig 11.2.2 (RS232 serial cable is connected between COM port of PC and MON port of TEST JIG, in general.)
2. Run **Hot Kimchi.exe** to start calibration.
3. From the Calibration menu, Select KP202!





## 11. AUTO CALIBRATION

### 4. Press Calibration START



### 11.5 AGC

This procedure is for Rx calibration.

In this procedure, We can get RSSI correction value. Set band EGSM and press Start button the result window will show correction values per every power level and gain code and the same measure is performed per every frequency.

### 11.6 APC

This procedure is for Tx calibration.

In this procedure you can get proper scale factor value and measured power level.

### 11.7 ADC

This procedure is for battery calibration.

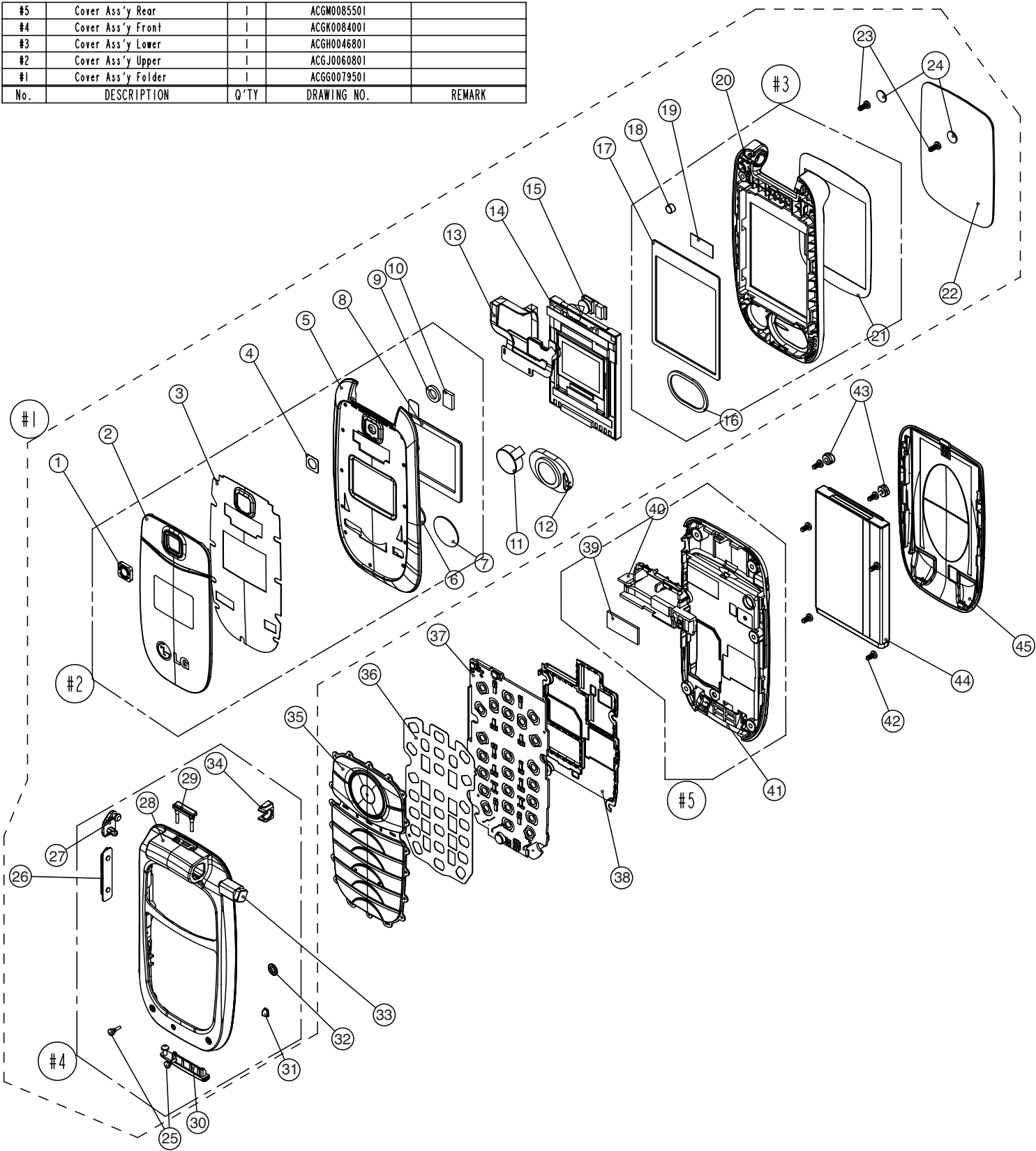
You can get main Battery Config Table and temperature Config Table will be reset.

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12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW

#5	Cover Ass'y Rear	1	ACGM0085501	
#4	Cover Ass'y Front	1	ACGK0084001	
#3	Cover Ass'y Lower	1	ACGH0046801	
#2	Cover Ass'y Upper	1	ACGJ0060801	
#1	Cover Ass'y Folder	1	ACG60079501	
No.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK



45	COVER_BATTERY	1	MCJA0039901	
44	BATTERY	1	SBPL0086001	
43	CAP_SCREW_MAIN	2	MCCH0100001	
42	SCREW_MACHINE_M1.4_L3.0	6	GMEY0011201	
41	COVER_REAR	1	MCJN0063501	
40	ANTENNA	1	SNGF0022702	
39	PAD_CONN_FPCB	1	MPBZ0175001	
38	SHIELD_CAN_ASS'Y	1	MCBA0014801	
37	PCB_ASS'Y	1	SAFY0188501	
36	DOME_ASS'Y	1	ADCA0061901	
35	KEYPAD_ASS'Y	1	AKAB0007901	
34	BRACKET_HINGE	1	MBFZ0027401	
33	HINGE_FOLDER	1	MHFD0013702	
32	FILTER_MIC.	1	MFB00020701	
31	INDICATOR_LED	1	M1AA0020601	
30	CAP_RECEPTACLE	1	MCCE0035101	
29	STOPPER	1	MSGY0020601	
28	COVER_FRONT	1	MCJK0067801	
27	CAP_EARPHONE	1	MCCC0042301	
26	BUTTON_SIDE	1	MBJL0038001	
25	BUMPER	2	MBHY0003512	
24	CAP_SCREW_FOLDER	2	MCCH0101701	
23	SCREW_MACHINE_M1.4_L3.5	2	GMEY0009201	
22	WINDOW_MAIN	1	MWAC0076401	
21	TAPE_WINDOW_MAIN	1	MTAD0065201	
20	COVER_LOWER	1	MCJH0037601	
19	TAPE_CAMERA	1	MTAZ0184201	
18	MAGNETIC	1	MMAA0008201	
17	PAD_LCD(MAIN)	1	MPBG0057401	
16	FILTER_SPEAKER	1	MFBC0029201	
15	CAMERA_MODULE	1	SVCY0012602	
14	LCD_MODULE	1	SVLM0020301	
13	FPCB_ASS'Y	1	SACY0046102	
12	SPEAKER	1	SUSY0025901	
11	VIBRATOR	1	SJMY0006503	
10	PAD_CONN_CAMERA	1	MPBZ0174901	
9	PAD_CAMERA	1	MPBT0038501	
8	PAD_LCD(SUB)	1	MPBQ0031001	
7	PAD_SPEAKER	1	MPBN0039701	
6	PAD_VIBRATOR	1	MPBJ0041401	
5	COVER_UPPER	1	MCJJ0046901	
4	TAPE_WINDOW_CAMERA	1	MTAZ0184301	
3	TAPE_WINDOW_SUB	1	MTAE0030201	
2	WINDOW_SUB	1	MWAF0035801	
1	WINDOW_CAMERA	1	MWAE0024101	
NO.	DESCRIPTION	Q'TY	DRAWING NO.	REMARK



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
1		GSM(FOLDER)	TGFF0094945		Black	
2	AAAY00	ADDITION	AAAY0205016		Black	
3	MCJA00	COVER,BATTERY	MCJA0039901	MOLD, PC LUPOY SC-1004A, , , , ,	Black	45
2	APEY00	PHONE	APEY0373905	KP202 ORU, BK	Black	
3	ACGG00	COVER ASSY,FOLDER	ACGG0079503	KP202 Folder Ass'y, Orange	Black	
4	ACGH00	COVER ASSY, FOLDER(LOWER)	ACGH0046801	KP202 Lower Ass'y, Common	Black	
5	MCJH00	COVER,FOLDER(LOWER)	MCJH0037601	MOLD, PC LUPOY SC-1004A, , , , ,	Black	20
5	MFBC00	FILTER,SPEAKER	MFBC0029201	COMPLEX, (empty), , , , ,	Without Color	16
5	MMAA00	MAGNET,SWITCH	MMAA0008201	COMPLEX, (empty), , , , ,	Metal Silver	18
5	MPBG00	PAD,LCD	MPBG0057401	COMPLEX, (empty), , , , ,	Without Color	17
5	MPBZ00	PAD	MPBZ0183601	COMPLEX, (empty), , , , ,	Without Color	
5	MTAD00	TAPE,WINDOW	MTAD0065201	COMPLEX, (empty), , , , ,	Without Color	21
5	MTAF00	TAPE,MOTOR	MTAF0011101	CUTTING, NS, , , , ,	Black	
5	MTAZ00	TAPE	MTAZ0184201	COMPLEX, (empty), , , , ,	Without Color	19
4	ACGJ00	COVER ASSY, FOLDER(UPPER)	ACGJ0060801	KP202 Upper Ass'y, Common	Black	
5	AWAB00	WINDOW ASSY,LCD	AWAB0026601	KP202 Window Sub, Open, Black	Black	
6	BFAA00	FILM,INMOLD	BFAA0062901	;,[empty], , , , ,	Black	
5	MCJJ00	COVER,FOLDER(UPPER)	MCJJ0046901	MOLD, PC LUPOY SC-1004A, , , , ,	Black	5
5	MGAD00	GASKET,SHIELD FORM	MGAD0137401	COMPLEX, (empty), , , , ,	Gold	
5	MPBJ00	PAD,MOTOR	MPBJ0041401	COMPLEX, (empty), , , , ,	Without Color	6
5	MPBN00	PAD,SPEAKER	MPBN0039701	COMPLEX, (empty), , , , ,	Without Color	7
5	MPBQ00	PAD,LCD(SUB)	MPBQ0031001	COMPLEX, (empty), , , , ,	Without Color	8
5	MPBT00	PAD,CAMERA	MPBT0038501	COMPLEX, (empty), , , , ,	Without Color	9
5	MPBZ00	PAD	MPBZ0174901	COMPLEX, (empty), , , , ,	Without Color	10
5	MPBZ01	PAD	MPBZ0185601	COMPLEX, (empty), , , , ,	Black	
5	MPBZ02	PAD	MPBZ0185701	COMPLEX, (empty), , , , ,	Black	
5	MTAB00	TAPE,PROTECTION	MTAB0151301	COMPLEX, (empty), , , , ,	Transparent	

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
5	MTAB02	TAPE,PROTECTION	MTAB0157601	COMPLEX, (empty), , , , ,	Transparent	
5	MTAE00	TAPE,WINDOW(SUB)	MTAE0030201	COMPLEX, (empty), , , , ,	Without Color	3
5	MTAZ00	TAPE	MTAZ0184301	COMPLEX, (empty), , , , ,	Without Color	4
5	MWAE00	WINDOW,CAMERA	MWAE0024101	CUTTING, PMMA MR 200, , , , ,	Without Color	1
4	ACGK00	COVER ASSY,FRONT	ACGK0084002	KP202 Front Ass'y, Orange	Black	
5	MBFZ00	BRACKET	MBFZ0027401	MOLD, PC LUPOY SC-1004A, , , , ,	Gray	34
5	MBHY00	BUMPER	MBHY0003512	MOLD, Urethane Rubber S190A, , , , ,	Dark Gray	25
5	MBJL00	BUTTON,SIDE	MBJL0038001	MOLD, PC LUPOY SC-1004A, , , , ,	Titan Silver	26
5	MCCC00	CAP,EARPHONE JACK	MCCC0042301	MOLD, PC LUPOY SC-1004A, , , , ,	Silver	27
5	MCCE00	CAP,RECEPTACLE	MCCE0035101	MOLD, PC LUPOY SC-1004A, , , , ,	Silver	30
5	MCJK00	COVER,FRONT	MCJK0067802	MOLD, PC LUPOY SC-1004A, , , , ,	Black	28
5	MFBD00	FILTER,MIKE	MFBD0020701	COMPLEX, (empty), , , , ,	Black	32
5	MIAA00	INDICATOR,LED	MIAA0020601	MOLD, PC LUPOY SC-1004A, , , , ,	Without Color	31
5	MPBZ00	PAD	MPBZ0183401	COMPLEX, (empty), , , , ,	Black	
5	MSGY00	STOPPER	MSGY0020601	MOLD, Urethane Rubber S190A, , , , ,	Black	29
4	GMEY00	SCREW MACHINE,BIND	GMEY0009201	1.4 mm,3.5 mm,MSWR3(BK) ,B ,+ ,HEAD D=2.7mm	Black	23
4	MCCH00	CAP,SCREW	MCCH0101701	COMPLEX, (empty), , , , ,	Black	24
4	MHFD00	HINGE,FOLDER	MHFD0013702	COMPLEX, (empty), , , , ,	Without Color	33
4	MLAC00	LABEL,BARCODE	MLAC0003401	EZ LOOKS(user for mechanical)	Without Color	
4	MPBZ00	PAD	MPBZ0185801	COMPLEX, (empty), , , , ,	Black	
4	MTAB00	TAPE,PROTECTION	MTAB0157101	COMPLEX, (empty), , , , ,	Without Color	
4	MWAC00	WINDOW,LCD	MWAC0076403	COMPLEX, (empty), , , , ,	Dark Gray	22
3	ACGM00	COVER ASSY,REAR	ACGM0085501	KP202 Rear Ass'y, Common	Black	
4	MCJN00	COVER,REAR	MCJN0063501	MOLD, PC LUPOY SC-1004A, , , , ,	Black	41
4	MGAD00	GASKET,SHIELD FORM	MGAD0142201	COMPLEX, (empty), 0.1, , , ,	Silver	
4	MGAD01	GASKET,SHIELD FORM	MGAD0142301	COMPLEX, (empty), 0.3, , , ,	GOLDEN YELLOW	
4	MLAB00	LABEL,A/S	MLAB0001102	C2000 USASV DIA 4.0	White	
4	MPBU00	PAD,CONNECTOR	MPBU0003501	COMPLEX, (empty), , , , ,	Black	
4	MPBZ00	PAD	MPBZ0175001	COMPLEX, (empty), , , , ,	Without Color	39
3	AKAB00	KEYPAD ASSY,FOLDER	AKAB0007913	KP202 Orange	Silver	35

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	GMEY00	SCREW MACHINE,BIND	GMEY0011201	1.4 mm,3 mm,MSWR3(BK) ,N ,+ ,NYLOK	Without Color	42
3	MCCH00	CAP,SCREW	MCCH0100001	MOLD, Silicone Rubber K-770, , , , ,	Silver	43
3	MLAK00	LABEL,MODEL	MLAK0006901			
3	SAFY	PCB ASSY,MAIN	SAFY0188513			37
4	SAFB00	PCB ASSY,MAIN,INSERT	SAFB0069401			
5	ADCA00	DOME ASSY,METAL	ADCA0061901	KP202 DOME SHEET	Black	36
5	MCBA00	CAN,SHIELD	MCBA0014801	PRESS, STS, , , , ,	Silver	38
5	MPBH00	PAD,MIKE	MPBH0028301	COMPLEX, (empty), , , , ,	Black	
5	MLAB00	LABEL,A/S	MLAB0000601	HUMIDITY STICKER	Without Color	



## <Main component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
4	SACY00	PCB ASSY,FLEXIBLE	SACY0046102			13
5	SACE00	PCB ASSY,FLEXIBLE,SMT	SACE0041302			
6	SACC01	PCB ASSY,FLEXIBLE,SMT BOTTOM	SACC0024002			
7	ENBY01	CONNECTOR,BOARD TO BOARD	ENBY0019501	20 PIN,4 mm,ETC , ,H=1.5, Socket		
7	ENBY02	CONNECTOR,BOARD TO BOARD	ENBY0020202	60 PIN,0.4 mm,STRAIGHT ,AU ,STACKING HEIGHT 0.9 / HEADDER FOR KEYPAD TO MAIN		
7	ENBY03	CONNECTOR,BOARD TO BOARD	ENBY0036101	44 PIN,0.4 mm,ETC , ,H=1.0, Plug		
7	SEVY00	VARISTOR	SEVY0005502	18 V , ,SMD ,10 Ohm , 7.5pF , 4ch Array		
7	SFEY00	FILTER,EMI/POWER	SFEY0009801	SMD ,18V, SMD, 6CH, 7.5pF, 10ohm, EMI/ESD Fillter Array, Pb-free		
6	SPCY01	PCB,FLEXIBLE	SPCY0095901	POLYI ,.4 mm,MULTI-5 ,GB1-E FPCB ,; , , , , , , , , , ,		
4	SBCL00	BATTERY,CELL,LITHIUM	SBCL0001303	2 V,1 mAh,COIN ,SOLDER TYPE BACKUP BATTERY		
4	SJMY00	VIBRATOR,MOTOR	SJMY0006506	3 V,0.08 A,10*3.45 ,17mm		11
4	SUSY00	SPEAKER	SUSY0025901	ASSY ,8 ohm,91 dB, mm,Wire 15mm ,; , , , , , , ,20*14*3.5T ,WIRE		12
4	SVCY00	CAMERA	SVCY0012601	CMOS ,VGA ,MAGNACHIP 1/7.4"		15
4	SVLM00	LCD MODULE	SVLM0020302	MAIN ,M_1.77"QQV S_0.91"(96*64) Mono ,33.8x46.24x3.7 ,262k ,TFT ,TM ,M_LGDP4512 S_S6B0724 ,Thickness_3.7t		14
4	SNGF00	ANTENNA,GSM,FIXED	SNGF0022702	3.0 ,-2.0 dBd,, ,internal, GSM900/1800/1900 ,; ,TRIPLE ,-2.0 ,50 ,3.0		40
5	SPKY00	PCB,SIDEKEY	SPKY0046101	POLYI ,.65 mm,DOUBLE ,; ,; , , , , , , , ,		
5	SUMY00	MICROPHONE	SUMY0003802	FPCB ,-42 dB,4*1.5 ,		
4	SAFF00	PCB ASSY,MAIN,SMT	SAFF0109913			
5	SAFC00	PCB ASSY,MAIN,SMT BOTTOM	SAFC0085601			
6	C100	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C101	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C102	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C103	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C104	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C105	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C106	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C107	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C108	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C109	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C110	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C111	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C112	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C113	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C114	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C115	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C116	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C117	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C118	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C119	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C120	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C121	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C123	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C126	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C127	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C128	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C129	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C130	CAP,CERAMIC,CHIP	ECCH0002002	47000 pF,10V ,K ,B ,HD ,1005 ,R/TP		
6	C131	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C132	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C133	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C134	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C135	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C136	CAP,CERAMIC,CHIP	ECCH0005704	4700000 pF,10V ,K ,X5R ,HD ,2012 ,R/TP		
6	C137	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C138	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C139	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C140	CAP,CERAMIC,CHIP	ECCH0000165	68 nF,6.3V,K,X5R,HD,1005,R/TP		
6	C141	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C142	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C143	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C144	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C145	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C146	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C147	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C148	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C149	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C150	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C151	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C152	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C153	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C154	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C155	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C158	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C200	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C201	CAP,TANTAL,CHIP	ECTH0001701	10 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C203	CAP,TANTAL,CHIP	ECTH0001701	10 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C207	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C211	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C212	CAP,TANTAL,CHIP	ECTH0001701	10 uF,6.3V ,M ,L _ESR ,2012 ,R/TP		
6	C213	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C216	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C220	CAP,TANTAL,CHIP	ECTH0002001	10 uF,10V ,M ,STD ,2012 ,R/TP		
6	C222	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C224	CAP,CHIP,MAKER	ECZH0001421	2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP		
6	C225	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C226	CAP,CHIP,MAKER	ECZH0001213	0.47 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C227	CAP,CHIP,MAKER	ECZH0001213	0.47 uF,6.3V ,Z ,Y5V ,TC ,1005 ,R/TP		
6	C228	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C300	CAP,TANTAL,CHIP	ECTH0002001	10 uF,10V ,M ,STD ,2012 ,R/TP		
6	C301	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C303	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C304	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C305	CAP,CERAMIC,CHIP	ECCH0007801	4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP		
6	C318	CAP,CERAMIC,CHIP	ECCH0006201	4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP		
6	C319	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C324	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C325	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C400	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C401	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C402	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C403	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C404	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C405	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C406	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C407	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C408	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C409	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C410	CAP,CHIP,MAKER	ECZH0003202	1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP		
6	C411	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C412	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C413	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C414	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C416	CAP,CHIP,MAKER	ECZH0001420	1 uF,10V ,K ,X5R ,HD ,1608 ,R/TP		
6	C500	CAP,CHIP,MAKER	ECZH0000816	12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C501	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C502	CAP,CERAMIC,CHIP	ECCH0000113	18 pF,50V,J,NP0,TC,1005,R/TP		
6	C503	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C504	CAP,CERAMIC,CHIP	ECCH0000393	22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP		
6	C505	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C506	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C507	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C508	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C509	CAP,CERAMIC,CHIP	ECCH0000155	10 nF,16V,K,X7R,HD,1005,R/TP		
6	C510	CAP,CHIP,MAKER	ECZH0000830	33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C511	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C513	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C514	CAP,CERAMIC,CHIP	ECCH0000122	47 pF,50V,J,NP0,TC,1005,R/TP		
6	C515	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C518	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C519	CAP,CERAMIC,CHIP	ECCH0000143	1 nF,50V,K,X7R,HD,1005,R/TP		
6	C520	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C521	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C522	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C523	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C524	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C525	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C526	CAP,CERAMIC,CHIP	ECCH0000180	3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C527	CAP,CHIP,MAKER	ECZH0001216	220 nF,10V ,K ,X5R ,TC ,1005 ,R/TP		
6	C528	CAP,CERAMIC,CHIP	ECCH0000180	3.3 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C529	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C530	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C531	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C532	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C533	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C534	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C535	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C536	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C537	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C538	CAP,CHIP,MAKER	ECZH0000841	56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C539	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C540	CAP,CERAMIC,CHIP	ECCH0000195	3.9 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP		
6	C541	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C542	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C543	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C544	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C545	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C546	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C547	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C600	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C601	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C603	CAP,CERAMIC,CHIP	ECCH0000115	22 pF,50V,J,NP0,TC,1005,R/TP		
6	C604	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C606	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C607	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C608	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	CN301	CONNECTOR,I/O	ENRY0003501	24 PIN,0.5 mm,ANGLE , ,		
6	CN500	CONN,RF SWITCH	ENWY0005301	,SMD , dB,H=1.85 ,; ,3.00MM ,STRAIGHT ,RF ADAPTER ,SMD ,R/TP ,AU , ,		
6	CN600	CONNECTOR,BOARD TO BOARD	ENBY0020402	60 PIN,0.4 mm,STRAIGHT ,AU ,STACKING HEIGHT 0.9 / SOCKET FOR KEYPAD TO MAIN		
6	D100	DIODE,SWITCHING	EDSY0009901	ESC ,80 V,300 A,R/TP ,1.6*0.8*0.6(t)		
6	D101	DIODE,SWITCHING	EDSY0012101	US-FLAT ,30 V,1 A,R/TP ,2.5*1.25*0.6(t)		
6	FB100	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FB200	FILTER,BEAD,CHIP	SFBH0008101	600 ohm,1005 ,		
6	FB400	FILTER,BEAD,CHIP	SFBH0007102	10 ohm,1005 ,Ferrite Bead		
6	FL500	FILTER,SEPERATOR	SFAY0007203	900 ,1800.1900 , dB, dB, dB, dB,ETC ,Tri-band FEM		
6	FL600	FILTER,EMI/POWER	SFEY0007102	SMD ,5.6 V,SMD ,4ch. R-Varistor Array(400Ohm,25pF)		
6	FL601	FILTER,EMI/POWER	SFEY0007102	SMD ,5.6 V,SMD ,4ch. R-Varistor Array(400Ohm,25pF)		
6	FL602	FILTER,EMI/POWER	SFEY0007102	SMD ,5.6 V,SMD ,4ch. R-Varistor Array(400Ohm,25pF)		
6	FL603	FILTER,EMI/POWER	SFEY0007102	SMD ,5.6 V,SMD ,4ch. R-Varistor Array(400Ohm,25pF)		
6	FL604	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	FL605	VARISTOR	SEVY0005502	18 V ,SMD ,10 Ohm , 7.5pF , 4ch Array		
6	FL606	VARISTOR	SEVY0005502	18 V ,SMD ,10 Ohm , 7.5pF , 4ch Array		
6	FL607	VARISTOR	SEVY0005502	18 V ,SMD ,10 Ohm , 7.5pF , 4ch Array		
6	FL608	FILTER,EMI/POWER	SFEY0007103	SMD ,18 V ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free		
6	J100	CONN,SOCKET	ENSY0014601	6 PIN,ETC , ,2.54 mm,H=2.3		
6	J200	CONN,JACK/PLUG, EARPHONE	ENJE0002301	3,5 PIN,G7000 EAR JACK 3 pole, 5 pin KSD		
6	L501	INDUCTOR,CHIP	ELCH0005002	2.7 nH,S ,1005 ,R/TP ,		
6	L502	INDUCTOR,CHIP	ELCH0001036	5.6 nH,S ,1005 ,R/TP ,PBFREE		
6	L503	INDUCTOR,CHIP	ELCH0001003	6.8 nH,J ,1005 ,R/TP ,chip inductor PBFREE		
6	L504	INDUCTOR,CHIP	ELCH0001032	18 nH,J ,1005 ,R/TP ,PBFREE		
6	Q100	TR,BJT,NPN	EQBN0007101	EMT3 ,0.15 W,R/TP ,LOW FREQUENCY		
6	Q101	TR,BJT,ARRAY	EQBA0000406	SC-70 ,0.2 W,R/TP ,CDMA,Common use		
6	Q102	TR,FET,P-CHANNEL	EQFP0004201	2.9*1.9*0.8(t) ,.7 W,20 V,-6 A,R/TP ,NDC652P upgrade(substitution) item, Pb free		
6	Q300	TR,BJT,ARRAY	EQBA0002701	EMT6 ,150 mW,R/TP ,NPN, PNP, 150 mA		
6	Q301	TR,BJT,NPN	EQBN0004801	SMT6 ,0.2 W,R/TP ,		
6	R100	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R101	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R102	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R103	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R104	RES,CHIP	ERHY0000512	10M ohm,1/16W,J,1608,R/TP		
6	R105	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R106	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R107	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R108	RES,CHIP,MAKER	ERHZ0000702	10 ohm,1/10W ,J ,1608 ,R/TP		
6	R109	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R110	RES,CHIP,MAKER	ERHZ0000529	1.5 Kohm,1/16W ,J ,1005 ,R/TP		
6	R111	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R112	RES,CHIP,MAKER	ERHZ0000533	7.5 Kohm,1/16W ,J ,1005 ,R/TP		
6	R113	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R114	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R115	RES,CHIP,MAKER	ERHZ0000527	200 ohm,1/6W ,J ,1005 ,R/TP		
6	R116	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R117	RES,CHIP	ERHY0001102	0.2 ohm,1/4W ,F ,2012 ,R/TP		
6	R118	RES,CHIP,MAKER	ERHZ0000464	330 ohm,1/16W ,J ,1005 ,R/TP		
6	R119	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R120	RES,CHIP	ERHY0000278	82K ohm,1/16W,J,1005,R/TP		
6	R121	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R123	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		
6	R124	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R125	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R126	RES,CHIP,MAKER	ERHZ0000431	18 Kohm,1/16W ,J ,1005 ,R/TP		
6	R128	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R201	RES,CHIP,MAKER	ERHZ0000437	2 Kohm,1/16W ,J ,1005 ,R/TP		
6	R202	RES,CHIP,MAKER	ERHZ0000438	20 Kohm,1/16W ,J ,1005 ,R/TP		
6	R203	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R204	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R206	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R208	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R212	RES,CHIP,MAKER	ERHZ0000407	1000 Kohm,1/16W ,J ,1005 ,R/TP		
6	R214	RES,CHIP,MAKER	ERHZ0000488	4.7 ohm,1/16W ,J ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R215	RES,CHIP,MAKER	ERHZ0000467	330 Kohm,1/16W ,J ,1005 ,R/TP		
6	R216	RES,CHIP,MAKER	ERHZ0000407	1000 Kohm,1/16W ,J ,1005 ,R/TP		
6	R217	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R218	RES,CHIP,MAKER	ERHZ0000476	39 Kohm,1/16W ,J ,1005 ,R/TP		
6	R219	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R220	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R221	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R222	RES,CHIP,MAKER	ERHZ0000476	39 Kohm,1/16W ,J ,1005 ,R/TP		
6	R310	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R312	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R313	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R314	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R317	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R318	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R320	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R321	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R324	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R325	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R326	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R328	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R329	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R331	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R332	RES,CHIP,MAKER	ERHZ0000483	47 ohm,1/16W ,J ,1005 ,R/TP		
6	R333	RES,CHIP,MAKER	ERHZ0002401	12 Kohm,1/16W ,J ,1005 ,R/TP		
6	R335	RES,CHIP,MAKER	ERHZ0002401	12 Kohm,1/16W ,J ,1005 ,R/TP		
6	R341	RES,CHIP,MAKER	ERHZ0000486	47 Kohm,1/16W ,J ,1005 ,R/TP		
6	R342	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R343	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R344	RES,CHIP,MAKER	ERHZ0000438	20 Kohm,1/16W ,J ,1005 ,R/TP		
6	R357	RES,CHIP,MAKER	ERHZ0000533	7.5 Kohm,1/16W ,J ,1005 ,R/TP		
6	R359	RES,CHIP,MAKER	ERHZ0002401	12 Kohm,1/16W ,J ,1005 ,R/TP		
6	R360	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R361	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R362	RES,CHIP,MAKER	ERHZ0002401	12 Kohm,1/16W ,J ,1005 ,R/TP		



## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R363	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R364	RES,CHIP,MAKER	ERHZ0000402	10 ohm,1/16W ,J ,1005 ,R/TP		
6	R400	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R402	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R403	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R404	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R405	RES,CHIP,MAKER	ERHZ0000438	20 Kohm,1/16W ,J ,1005 ,R/TP		
6	R406	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R500	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R501	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R503	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R504	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R506	RES,CHIP,MAKER	ERHZ0000522	24 ohm,1/16W ,J ,1005 ,R/TP		
6	R507	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R508	RES,CHIP	ERHY0003501	220 ohm,1/16W ,J ,1005 ,R/TP		
6	R509	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R510	RES,CHIP,MAKER	ERHZ0000429	180 ohm,1/16W ,J ,1005 ,R/TP		
6	R511	RES,CHIP,MAKER	ERHZ0000457	30 ohm,1/16W ,J ,1005 ,R/TP		
6	R512	RES,CHIP,MAKER	ERHZ0000429	180 ohm,1/16W ,J ,1005 ,R/TP		
6	R514	RES,CHIP,MAKER	ERHZ0000404	1 Kohm,1/16W ,J ,1005 ,R/TP		
6	R515	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R516	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R517	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R518	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R600	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R601	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R602	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R603	RES,CHIP,MAKER	ERHZ0000406	100 Kohm,1/16W ,J ,1005 ,R/TP		
6	R604	RES,CHIP,MAKER	ERHZ0000485	4700 ohm,1/16W ,J ,1005 ,R/TP		
6	R605	RES,CHIP,MAKER	ERHZ0000485	4700 ohm,1/16W ,J ,1005 ,R/TP		
6	U100	IC	EUSY0288701	BGA ,84 PIN,ETC ,256(1die flash)*64(PSRAM), 3V, 8x11.6x1.2mm, 84ball, Pb-Free		
6	U101	IC	EUSY0227901	SON5-P-0.35(fSV) , 5 PIN,R/TP ,2-INPUT AND GATE, Pb Free		
6	U102	IC	EUSY0227901	SON5-P-0.35(fSV) , 5 PIN,R/TP ,2-INPUT AND GATE, Pb Free		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	U103	IC	EUSY0154001	US8 ,8 PIN,R/TP ,Dual 2-Input OR Gate, Pb Free		
6	U104	IC	EUSY0280001	CSP_BGA ,289 PIN,R/TP ,GSM Onechip Baseband		
6	U201	IC	EUSY0250501	SC70 ,5 PIN,R/TP ,Comparator, pin compatible to EUSY0077701		
6	U202	IC	EUSY0331601	QFN ,8 PIN,R/TP ,		
6	U203	IC	EUSY0300101	WQFN ,10 PIN,R/TP ,Small package Dual SPDT analog Switch, PB-Free		
6	U400	IC	EUSY0319001	WDFN-8L ,8 PIN,R/TP ,300mA/300mA 2.8V/1.8V Dual LDO		
6	U401	IC	EUSY0319001	WDFN-8L ,8 PIN,R/TP ,300mA/300mA 2.8V/1.8V Dual LDO		
6	U402	IC	EUSY0318501	BGA ,84 PIN,R/TP ,7x7, VGA Camera Backend IC		
6	U403	IC	EUSY0238702	TSOPJW-12 ,12 PIN,R/TP ,3PORT Charge Pump(AAT2154 Low cost version)		
6	U500	PAM	SMPY0014001	35.5 dBm,56 % , A, dBc, dB,6x6x1.15 ,SMD ,Tri Band		
6	U501	IC	EUSY0280101	LFCSP-32 ,32 PIN,R/TP ,GSM QUAD BAND TRANSCEIVER, Othello G.		
6	VA202	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	VA203	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	VA204	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	VA300	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	VA301	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA302	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA303	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA310	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	VA311	VARISTOR	SEVY0003901	5.5 V , ,SMD ,480pF, 1005		
6	X100	X-TAL	EXXY0004602	.032768 MHz,20 PPM,12.5 pF,65000 ohm,SMD ,6.9*1.4*1.3 ,		
6	X500	X-TAL	EXXY0018403	26 MHz,10 PPM, pF, ohm,SMD ,3.2*2.5*0.7 ,temporary spec, W-191-451 , ,26 ,10PPM , , ,SMD ,R/TP		
5	SAFD00	PCB ASSY,MAIN,SMT TOP	SAFD0084501			
6	C125	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C208	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C209	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C210	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C214	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C215	CAP,CERAMIC,CHIP	ECCH0000120	39 pF,50V,J,NP0,TC,1005,R/TP		
6	C306	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C307	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	C308	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C309	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C310	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C311	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C312	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C313	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C314	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C315	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C316	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C317	CAP,CERAMIC,CHIP	ECCH0004904	1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP		
6	C320	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	C321	CAP,CERAMIC,CHIP	ECCH0000182	0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP		
6	C322	CAP,CERAMIC,CHIP	ECCH0000110	10 pF,50V,D,NP0,TC,1005,R/TP		
6	C323	CAP,CHIP,MAKER	ECZH0000826	27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP		
6	LD100	DIODE,LED,CHIP	EDLH0007901	RED ,1608 ,R/TP ,Indicator,0.4T Red LED		
6	LD300	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD301	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD302	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD303	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD304	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD305	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD306	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD307	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD308	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD309	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD310	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	LD311	DIODE,LED,CHIP	EDLH0006001	Blue ,1608 ,R/TP ,Blue SMD LED		
6	R209	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R210	RES,CHIP,MAKER	ERHZ0000401	0 ohm,1/16W ,J ,1005 ,R/TP		
6	R211	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R213	RES,CHIP,MAKER	ERHZ0000443	2200 ohm,1/16W ,J ,1005 ,R/TP		
6	R308	RES,CHIP,MAKER	ERHZ0000405	10 Kohm,1/16W ,J ,1005 ,R/TP		
6	R309	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R315	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Specification	Color	Remark
6	R316	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R319	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R322	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R327	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R330	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R334	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R336	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R337	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R338	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R339	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R340	RES,CHIP,MAKER	ERHZ0000505	680 ohm,1/16W ,J ,1005 ,R/TP		
6	R345	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R346	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R347	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R348	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R349	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R350	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R351	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R352	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R353	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R354	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R355	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R356	RES,CHIP	ERHY0003301	100 ohm,1/16W ,J ,1005 ,R/TP		
6	R358	RES,CHIP,MAKER	ERHZ0000493	51 Kohm,1/16W ,J ,1005 ,R/TP		
6	SPFY00	PCB,MAIN	SPFY0137001	FR-4 ,0.8 mm,BUILD-UP 8 ,GB1-E MAIN PCB ,,,,,,,,,,		
6	U300	IC	EUSY0129503	2x2 mm MLPD ,3 PIN,R/TP ,Hall Effect Switch, Pb Free		
6	VA200	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA201	VARISTOR	SEVY0003901	5.5 V ,SMD ,480pF, 1005		
6	VA304	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA305	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA306	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA307	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA308	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA309	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

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Level	Location No.	Description	Part Number	Specification	Color	Remark
6	VA312	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		
6	VA313	VARISTOR	SEVY0000702	14 V,10% ,SMD ,		

## 12. EXPLODED VIEW & REPLACEMENT PART LIST

### 12.3 Accessory

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Specification	Color	Remark
3	SBPL00	BATTERY PACK,LI-ION	SBPL0086001	3.7 V,830 mAh,1 CELL,PRISMATIC ,KG120 BATT, Europe Label, Pb-Free ,; ,3.7 ,830 ,0.2C ,PRISMATIC ,50x34x42 , ,BLACK ,Innerpack ,Europe Label		44
3	SGEY00	EAR PHONE/EAR MIKE SET	SGEY0003204	L1200 ,MONO TYPE		
3	SSAD00	ADAPTOR,AC-DC	SSAD0007835	FREE ,50 Hz,5.2 V,800 mA,CE,CB ,UK(IO.24P)		

## Note

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